

VIDEO BORESCOPE SYSTEM

Model: SV-1000

USER MANUAL

For information on our latest products and peripheral devices, refer to the following web site:

www.toshibacameras.com

Video Borescope System (SV-1000)
User Manual

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Irvine, CA●U.S.A.

Important Safeguards

WARNING indicates a hazardous situation which, if not avoided, could result in serious injury or death.



CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.



NOTICE indicates information considered important but not directly hazard-related (e.g. security, hygiene, equipment or property damage).



NOTICE

1. Read Instructions

Read all the safety and operating instructions before operating the product.

2. Retain Instructions

Retain the safety instructions and user's manual for future reference.

3. Follow Instructions

Follow all operating and use instructions

4. Ventilation

This camera should never be placed near or over a radiator or heat register. If this product is placed in a built-in installation, verify that there is proper ventilation so that the camera temperature operates within the recommended temperature range.

5. Performance Check

Upon completion of any service or repairs to this camera, ask the service technician to perform checks to determine that the camera is in proper operating condition.

6. Cleaning

Disconnect this camera from the power supply before cleaning. If not disconnected damage to product may occur. Care must be taken when you clean the camera. Scratches and dust will ruin the image quality of your camera. Do not use strong or abrasive detergents when cleaning the camera body. Use a dry cloth to clean the camera when it is dirty. In case the dirt is hard to remove, use a mild detergent and wipe the camera gently.

7. Handling

Do not drop or subject the camera to shock and vibration as this can damage camera.

8. Installation and Storage

- Do not install the camera in areas of extreme temperatures in excess of the allowable range.
- Avoid installing in humid or dusty places. The relative humidity must be below 90%.
- Avoid installing in places where radiation is present.
- Avoid installing in places where there are strong magnetic fields and/or electric signals.
- Avoid installing in places where the camera would be subject to strong vibrations.

CAUTION

9. Attachments

Do not use attachments not recommended by the camera manufacturer as they may pose safety risks.

10. Power Sources

This camera should be operated only from the type of power source indicated on the information label otherwise there may be a safety risk. If you are not sure of the type of power supply at your location, consult your product dealer.

11. Power-Cord Protection

Power cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them creating a safety risk. Pay particular attention to cords at plugs, screws and the point where they exit the product.

WARNING

12. Accessories

Do not place this camera on an unstable cart, stand, tripod, bracket or table. The camera may fall, causing possible injury to a person, or damage to the product. Use only with stand, tripod, bracket, or table recommended by the manufacturer, or sold with the camera. Any mounting of the product should follow the manufacturer's instructions, and should use a mounting accessory recommended by the manufacturer.

13. Lightning

For additional protection on this camera during a lightning storm, or when it is left unattended and unused for long periods of time, unplug it from the wall outlet and disconnect the power supply and cable system. This will prevent damage to the camera due to lightning and power line surges. If lightning occurs, do not touch the unit or any connected cables in order to avoid electric shock.

14. Overloading

Do not overload the power supply or extension cords as this can result in a risk of fire or electric shock.

15. Object and Liquid Entry

Never push objects of any kind into this camera through openings as they may touch dangerous electrical points or short-out parts that could result in a fire or electrical shock. Never intentionally spill liquid of any kind on the camera.

16. Servicing

Do not attempt to service this camera yourself as opening or removing covers may expose you to dangerous electrical or other hazards. Refer all servicing to qualified service personnel.

17. Damage Requiring Service

Disconnect this camera from the power supply and refer servicing to qualified service personnel under the following conditions as they may pose a safety risk.

- a. When the power-supply cord or plug is damaged.
- b. If the camera has been submerged in water.
- c. If the camera does not operate normally by following the operating instructions in the user's manual. Adjust only those controls that are covered by the user's manual as an improper adjustment of other controls may result in product damage and will often require extensive work by a qualified technician to restore the camera to its normal operation.
- d. If the camera has been dropped or the cabinet has been damaged.
- e. When the camera exhibits a distinct change in performance which indicates a need for service.
- f. Other trouble.

18. Replacement Parts

When replacing parts, be sure the service technician uses parts specified by the manufacturer or have the same characteristics as the original part. Unauthorized substitutions may result in fire, electric shock or other hazards.

CAUTION



Operating

Before using, make sure power supply and other cables are properly connected.

While operating, if any abnormal condition or malfunction is observed, stop using the camera immediately and then contact your local dealer.

Handling

Do not disassemble or tamper with parts inside the camera as opening or removing covers may expose you to dangerous electrical or other hazards.

Should you notice any trouble

If any trouble occurs while you are using the camera, turn off the power and contact your dealer. If you continue to use the camera when there is something wrong with it, the trouble may get worse and an unpredictable problem may occur.

Disclaimer and Limited Warranty – See TAIS' Limited Warranty which accompanies the product

DISCLAIMERS:

IF THIS PRODUCT IS NOT IN GOOD WORKING ORDER AS WARRANTED IN THE TAIS' LIMITED WARRANTY, YOUR SOLE AND EXCLUSIVE REMEDY SHALL BE THE REPAIR OR REPLACEMENT OF THE NON-CONFORMING PRODUCT. IN NO EVENT WILL ISD OR ITS SUPPLIERS OR ANY ASP BE LIABLE TO YOU OR ANY THIRD PARTY FOR ANY DAMAGES IN EXCESS OF THE PURCHASE PRICE OF THE PRODUCT. THIS LIMITATION APPLIES TO DAMAGES OF ANY KIND, INCLUDING ANY DIRECT OR INDIRECT DAMAGES, LOST PROFITS, LOST SAVINGS OR OTHER SPECIAL, INCIDENTAL, EXEMPLARY OR CONSEQUENTIAL DAMAGES, WHETHER FOR BREACH OF CONTRACT, TORT OR OTHERWISE, OR WHETHER ARISING OUT OF THE USE OF OR INABILITY TO USE SUCH PRODUCT, EVEN IF ISD, ITS SUPPLIERS, OR AN ASP HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES OR OF ANY CLAIM BY ANY OTHER PARTY. SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES FOR SOME PRODUCTS, SO THE ABOVE LIMITATIONS OR EXCLUSIONS MAY NOT APPLY TO YOU.

TAIS' LIMITED WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH MAY VARY FROM STATE TO STATE.

WHAT DOES TAIS' WARRANTY NOT COVER?

SERVICE MADE NECESSARY BY ACCIDENT, MISUSE, ABUSE, NEGLIGENCE, IMPROPER INSTALLATION/MAINTENANCE, MODIFICATIONS OR ALTERATIONS WITHOUT ISD'S PRIOR AUTHORIZATION, FIRE, ACTS OF GOD, REPAIRS BY NON-ISD AUTHORIZED SERVICE PROVIDERS, USE OUTSIDE OF ISD'S ENVIRONMENTAL OR OPERATING PARAMETERS.

SERVICE OF PRODUCT ON WHICH THE FACTORY LABEL OR LOGO, RATING LABEL OR SERIAL NUMBER HAVE BEEN DEFACED OR REMOVED. IN ADDITION, CABLE CUTS, NICKS AND SENSOR CABLE KINKS, CRUSHING OR BENDING WHICH EXCEED MINIMUM BENDING RADIUS, SERVICE MADE NECESSARY BY IMPROPER PROTECTION AND/OR HANDLING DURING CLEANING AND/OR DISINFECTION OR LIGHT LEAKS LOCATED WITHIN THE FLEXIBLE SENSOR SHEATH ARE SPECIFICALLY EXCLUDED FROM WARRANTY REPAIR OR REPLACEMENT.

LABOR SERVICE CHARGES FOR PRODUCT INSTALLATION, SET UP AND ADJUSTMENT OF CONTROLS ARE NOT COVERED BY THIS LIMITED WARRANTY.

Copyright and Right of Publicity

There may be a conflict with the Copyright Law and other laws when a customer uses, displays, distributes, or exhibits an image picked up by the camera without permission from the copyright holder. Please also note that transfer of an image or file covered by copyright is restricted to use within the scope permitted by the Copyright Law.

Protection of Personal Information

Images taken by the camera that reveal the likeness of an individual person may be considered personal information. To disclose, exhibit or transmit those images over the internet or otherwise, consent of the person may be required.

Usage Limitation

This Product is not designed for any "critical applications." "Critical applications" means life support systems, medical applications, connections to implanted medical devices, commercial transportation, nuclear facilities or systems, or any other applications where product failure could lead to injury to persons or loss of life or catastrophic property damage. ACCORDINGLY, TAIS DISCLAIMS ANY AND ALL LIABILITY ARISING OUT OF THE USE OF THE PRODUCT IN ANY CRITICAL APPLICATION. YOU ASSUME FULL RESPONSIBILITY FOR USE OF THE PRODUCT IN A CRITICAL APPLICATION. FURTHER, TAIS RESERVES THE RIGHT TO REFUSE TO SERVICE ANY PRODUCT USED IN A CRITICAL APPLICATION, AND DISCLAIMS ANY AND ALL LIABILITY ARISING OUT OF TAIS' SERVICE OR REFUSAL TO SERVICE THE PRODUCT.

The product is not intended for use in surgical endoscope and medical instrument inspection applications.

Regulation

FCC (USA) Information

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference, and
- (2) This device must accept any interference received, including interference that may cause undesired operation.

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules.

These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this



equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

CAUTION: Your authority to operate this FCC verified equipment could be voided if you make changes or modifications not expressly approved by the party.

Industry Canada Information

CAN ICES-003 A / NMB-3 A



handling of this product

This symbol on the product or on its packaging indicates that this product shall not be treated as household waste in accordance with Directive 2002/96/EC. Instead it shall be handed over to the applicable collection point for the recycling of electrical and electronic equipment. By proper waste handling of this product you ensure that it has no negative consequences for the environment and human health, which could otherwise be caused if this product is thrown into the garbage bin. The recycling of materials will help to conserve natural resources.



For more details information about recycling of this product, please contact your local city office, your household waste disposal service or the shop where you purchased the product.

Compliance is evidenced by written declaration from our suppliers, assuring that any potential trace contamination levels of restricted substances are below the maximum level set by EU Directive 2002/95/EC, or are exempted due to their application.

Warning



TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS PRODUCT TO RAIN OR MOISTURE.
DANGEROUS HIGH VOLTAGES ARE PRESENT INSIDE THE ENCLOSURE.

DO NOT OPEN THE CABINET.

THIS INSTALLATION SHOULD BE MADE BY A QUALIFIED SERVICE PERSON AND SHOULD CONFORM TO ALL LOCAL CODES.

REFER SERVICING TO QUALIFIED PERSONNEL ONLY.

WARNING

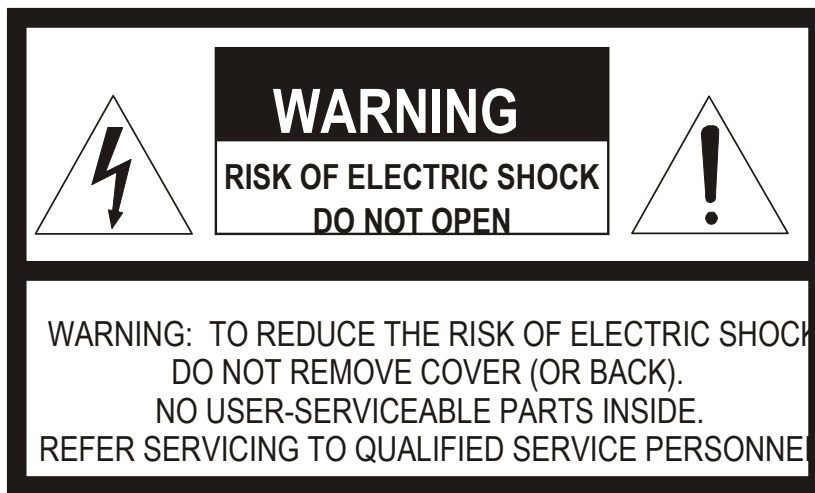


TABLE OF CONTENTS

Table of Contents	9
Introduction	10
Overview.....	10
Product Features.....	10
Getting Started	11
Box Contents – Ccu (SV-1D01N).....	11
Box Contents – Camera head (SV-1H01N).....	12
Camera Overview.....	13
System Diagram.....	13
CCU Diagram (front).....	14
CCU Diagram (rear).....	15
Dimensions.....	16
Setup & Configuration	17
Connecting the Camera.....	17
HDMI Monitor.....	17
USB 3.0 Viewer.....	17
Viewer Software.....	17
Installation.....	18
Viewer Software Operation.....	22
Specifications	25
Camera Specifications.....	25

INTRODUCTION

OVERVIEW

The SV-1000 is a revolutionary chip-on-tip video camera that delivers an excellent solution for various inspection applications. The 1.6 mm diameter camera system includes the ultra-small CMOS sensor with 400 x 400 pixel resolution, 120-degree FOV lens, and integrated LED light for illumination within a 1.9m flexible shaft. The incredibly small diameter sensor assembly connects to a separate camera/LED controller.

Product Features

19. Small size – only 1.6mm diameter O.D.
20. 400 x 400 pixel resolution
21. 120 degree FOV lens
22. Integrated LED light for illumination within a 1.9m flexible shaft
23. Water resistant SV-1H01N scope IPX7 and SV-1D01N CCU IPX4
24. Dual, simultaneous image outputs - HDMI and USB 3.0
25. Modular system with separate camera head/scope and CCU

GETTING STARTED

BOX CONTENTS – CCU (SV-1D01N)

Before proceeding, please check that the box contains the items listed here. If any item is missing or has visible damage, DO NOT install or operate the product and contact your dealer for assistance.



Camera Control Unit



Power Adapter



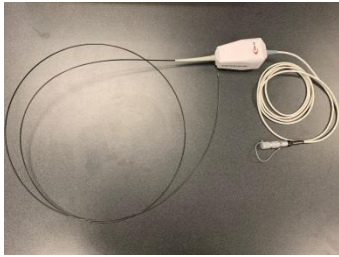
HDMI Cable



USB 3.0 Cable

BOX CONTENTS – CAMERA HEAD (SV-1H01N)

Before proceeding, please check that the box contains the items listed here. If any item is missing or has visible damage, DO NOT install or operate the product and contact your dealer for assistance.



Camera head

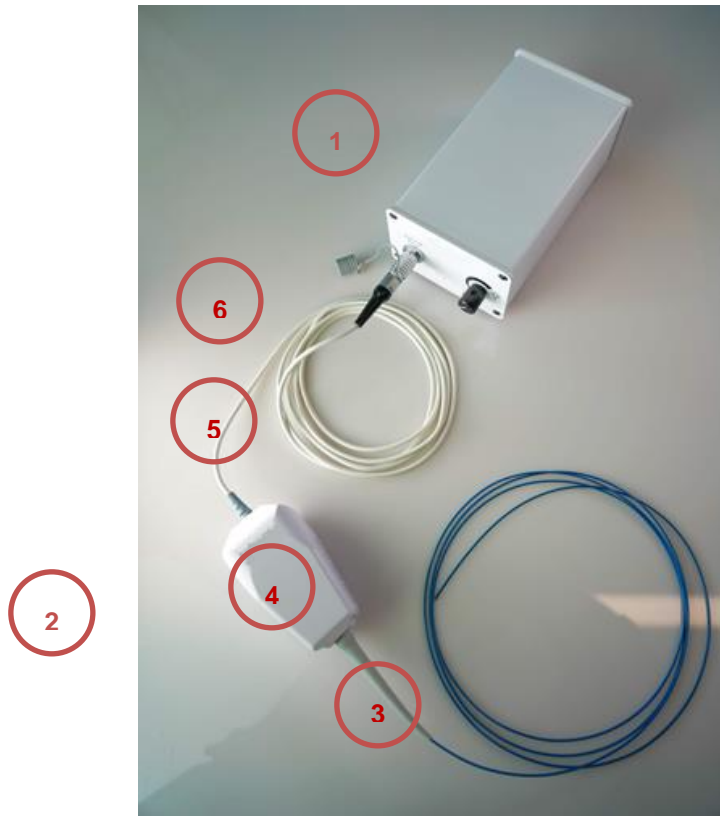


Protective coil

CAMERA OVERVIEW

Before installing or connecting the camera, please refer to this section and complete preparations for camera setup and all settings.

System Diagram



- 1 Camera Control Unit (CCU)
- 2 Camera/Scope assembly includes; LED Module and mount
- 3 Flexible sensor shaft
- 4 Camera tip, sensor and lens
- 5 Interconnecting Cable
- 6 Connector

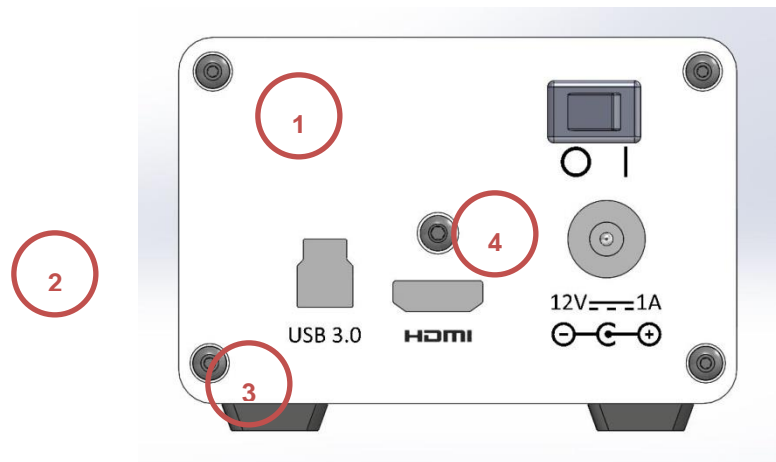
CCU Diagram (front)



- 1 Camera Input
- 2 LED control knob

The camera control unit (CCU) front panel has a camera input for connection to the camera head/scope. The light control knob is used to adjust the camera head LED intensity.

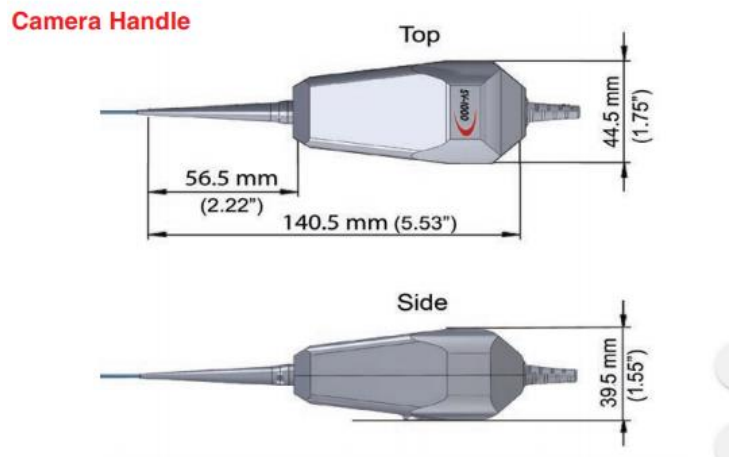
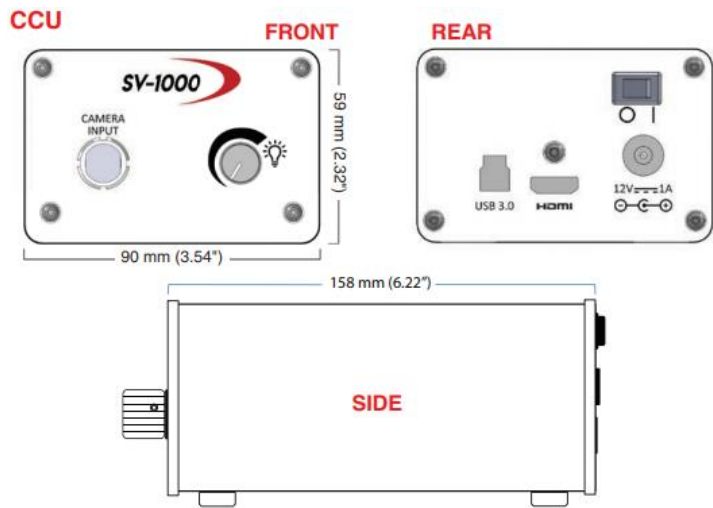
CCU Diagram (rear)



- 1 Power switch
- 2 USB 3.0 connector
- 3 HDMI output
- 4 12V DC Power input

The camera control unit (CCU) rear panel has a 12V DC power input for connection to the included power adapter. The HDMI output is used to connect to an external HDMI monitor. The USB 3.0 port connects to an external device for image capture and video recording. The power switch turns the system on and off.

Dimensions



SETUP & CONFIGURATION

CONNECTING THE CAMERA

HDMI Monitor

1. Remove the protective cap from the camera head connector. The connector is a pull release type connector; it may be necessary to pull back on the connector to release the cap.
2. Plug the camera head connector into the camera input on the CCU. Ensure that it is fully plugged in.
3. Connect the HDMI output on the CCU to an external HDMI monitor using the included HDMI cable.
4. Plug the 12V DC power adapter into the power input on the CCU. Plug the power adapter into a power source.
5. Turn the power switch to **ON** on the CCU.
6. Check that an image appears on the HDMI monitor.
7. Adjust the LED light using the LED control knob on the CCU.
8. Remove the camera head insertion tube from the protective coil.

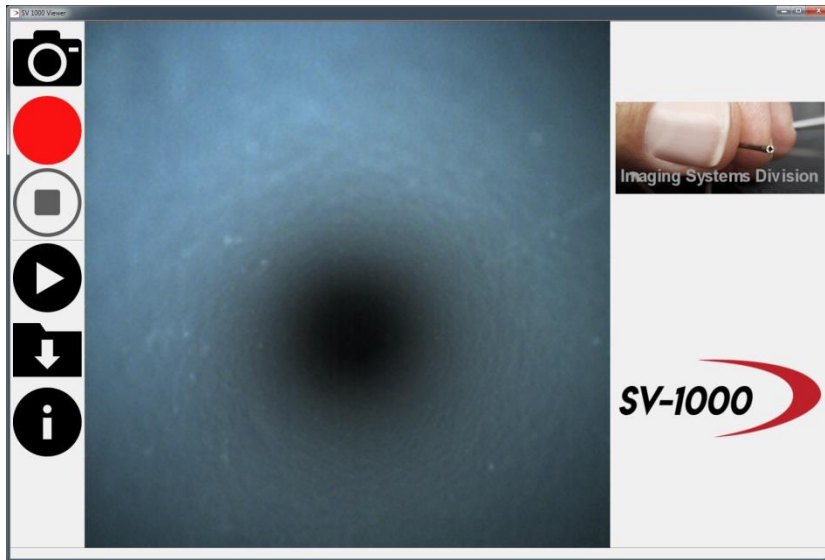
USB 3.0 Viewer

1. Remove the protective cap from the camera head connector. The connector is a pull release type connector; it may be necessary to pull back on the connector to release the cap.
2. Plug the camera head connector into the camera input on the CCU. Ensure that it is fully plugged in.
3. Connect the included USB 3.0 cable (B type end) to the USB 3.0 connector on the CCU.
4. Connect the USB 3.0 cable (A type end) to the viewing device. (viewing application software must be installed on the compatible tablet or Windows PC)
5. Plug the 12V DC power adapter into the power input on the CCU. Plug the power adapter into a power source.
6. Turn the power switch to **ON** on the CCU.
7. Launch the SV-1000 Viewer application as previously installed on the viewing device.
8. Check that an image appears on the SV-1000 Viewer application.
9. Adjust the LED light using the LED control knob on the CCU.
10. Remove the camera head insertion tube from the protective coil.

Note SV-1000 Viewer application is compatible with Windows OS only. Viewing device must have USB 3.0 input for compatibility.

VIEWER SOFTWARE

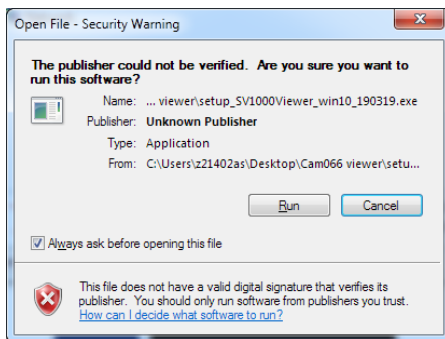
The SV-1000 Viewer is a Windows OS application that allows images and videos to be saved from the SV-1000 camera system.



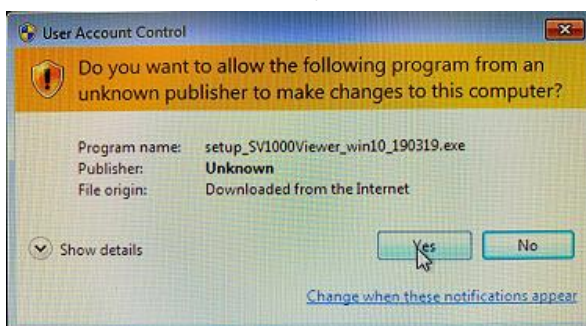
Note Before installing the SV-1000 Viewer application, ensure that all other applications are closed, especially teleconferencing software such as Skype.

Installation

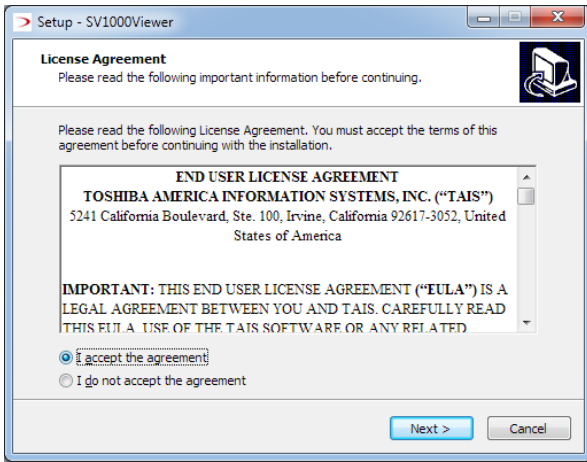
1. Run the setup_SV1000Viewer_win10.exe file.
2. If Windows displays a security warning message below, click on **Run**.



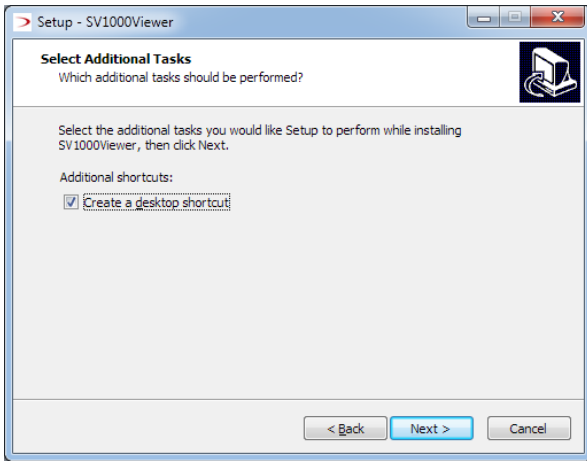
3. If User Access Control displays the permission prompt, click **Yes**.



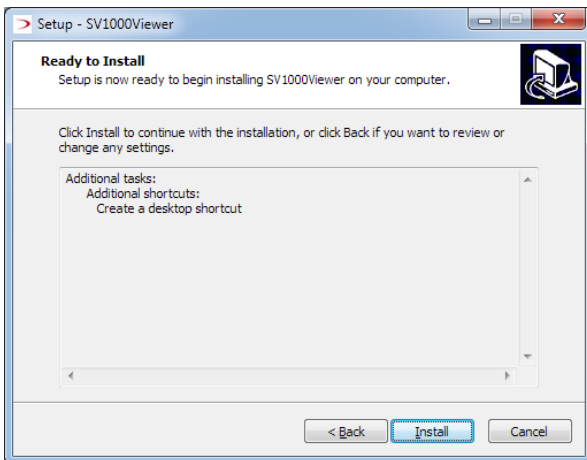
4. The installation wizard will begin to install the application.
5. Click on *I accept the agreement* to accept the license agreement. Then click **Next**.



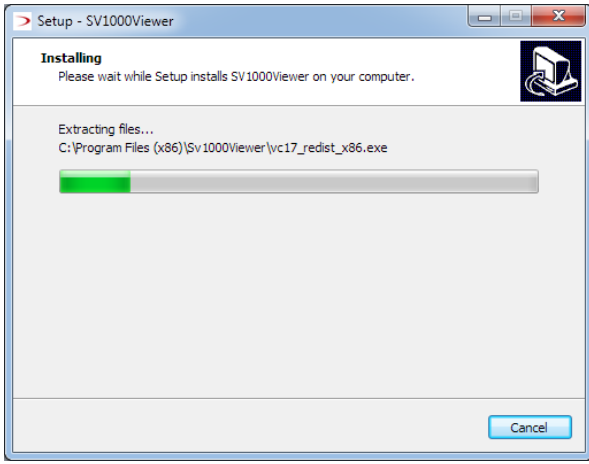
6. To install a shortcut on the desktop, check the box next to *Create a desktop shortcut*. Then click **Next**.



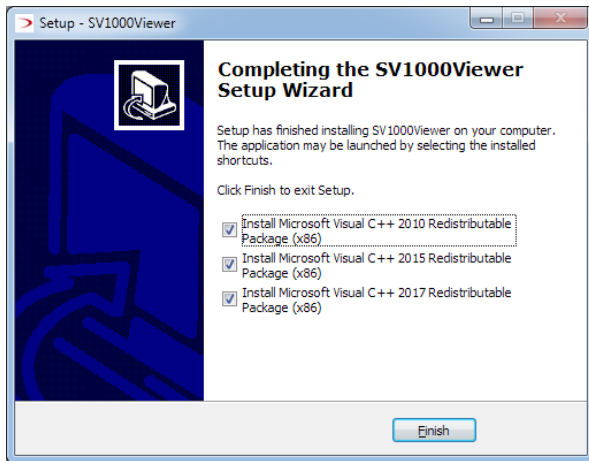
7. The installation wizard will confirm the options. Click **Install**.



8. The application will begin installing.

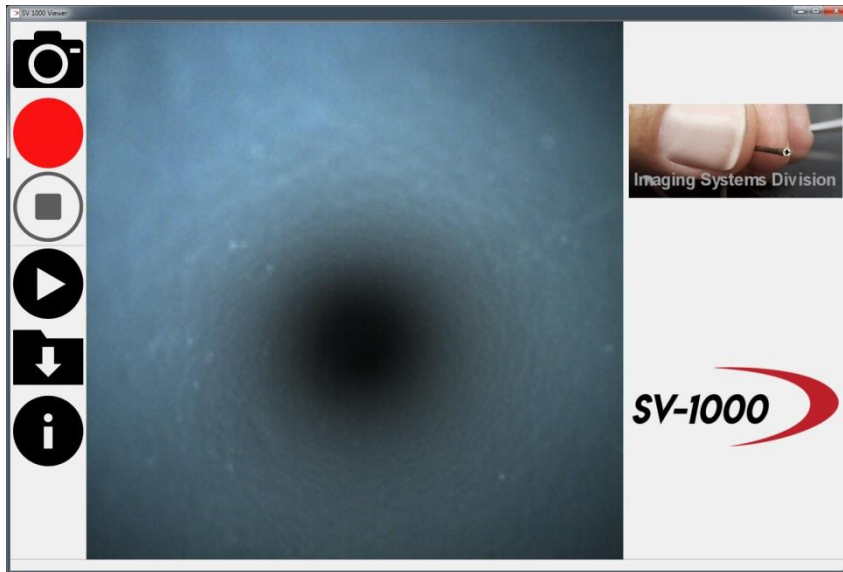


9. The installation wizard will install Microsoft Visual C++. Click Finish to begin the installation.



10. If prompted, accept the license agreement for installation of Microsoft Visual C++.
11. The installation wizard will automatically close after installation is complete.

Viewer Software Operation



Snapshot – Saves the current image as a .jpg to the file directory folder.

Record - Begins to record a video clip as an .avi to the file directory folder.

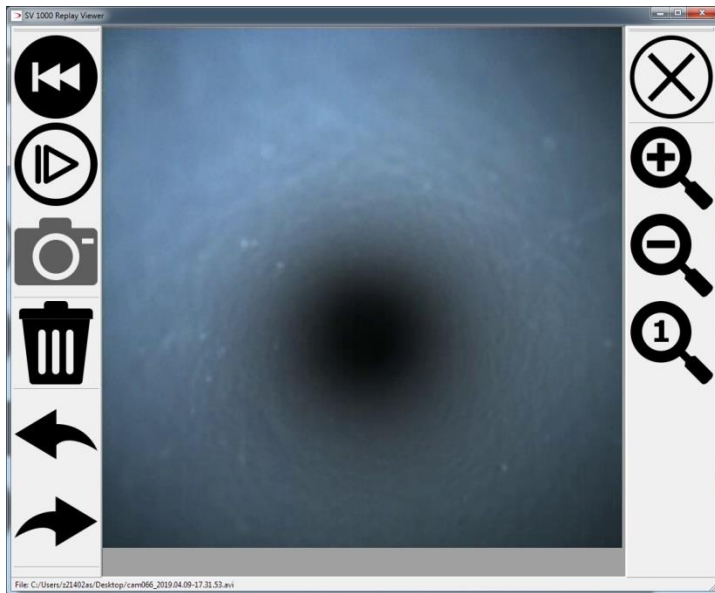
Stop Record – Ends the recording.

Play – Choose a previously recorded clip file to open the Replay window.

Folder – Sets the default file directory folder for saving images and video clips.

About – Displays the viewer version.

The Replay window opens when the Play icon is clicked.



Rewind – Rewinds the current video clip to the beginning.

Slow Motion Mode – Plays the current video clip at a slower playback speed.

Snapshot – Saves the current image as a .jpg to the file directory folder.

Delete File – Deletes the current video clip.

Previous File / Next File – Loads the previous or the next video clip.

Close – Closes the Replay window

Zoom In / Zoom Out – Zooms the current video clip in or zooms out

Zoom 1:1 – Resets the zoom level back to original size.

SPECIFICATIONS

CAMERA SPECIFICATIONS

SV-1000	Camera / Scope	Camera Control Unit
Model	SV-1H01N	SV-1D01N
Diameter	<1.6 mm	
Length (tip to handle)	1.9m	
Cable length (handle mount to CCU)	2.0m	
Total cable and sheath length	3.9m	
LED location	Handle mount	
Illumination	LED with glass fiber bundle	
Image Sensor		
Type	CMOS	
Size	1.05x1.05mm (1/18")	
Pixel Matrix	400 x 400	
Scanning System	Progressive	
Electronic Shutter	Rolling	
Optics		
FOV – Field of View	120°	
Depth of Focus	5mm to 50mm	
Magnification	Up to 12x (depends on viewing distance)	
F-Number	f5.0	
Focal Length	0.418mm	
IP Rating	IPX7	IPX4
Output		HDMI USB 3.0 (type B) 30 fps
SV-1000	Camera / Scope	Camera Control Unit
S/N Ratio		36.8dB
Camera / Scope Mount	¼ x 20 thread	
Dimensions	84 x 44 x 39 mm 3.3 x 1.8 x 1.6"	90 x 158 x 59mm 3.5 x 6.2 x 2.3"
Weight	0.148 kg (0.33lbs)	0.59 kg (1.3lbs)
Power Input		12V DC, 1A
Included Accessories		HDMI cable USB cable 12V power adapter
Optional Accessories	Gooseneck Mount	SV-1000 viewer software
Recorded image formats		.JPG for stills .AVI for video
PC Required for Use		No

