

SDI TO USB 3.0
CAPTURE BOX

CAP-1

Instruction Manual

www.datavideo.com

Table of Contents

FCC COMPLIANCE STATEMENT	4
WARNINGS AND PRECAUTIONS	4
WARRANTY	5
<i>STANDARD WARRANTY</i>	<i>5</i>
<i>THREE YEAR WARRANTY</i>	<i>6</i>
DISPOSAL	6
1. PRODUCT OVERVIEW	7
FEATURES	7
SYSTEM DIAGRAM	8
2. CONNECTIONS AND CONTROL	9
FRONT PANEL	9
REAR PANEL	9
3. BASIC SETUP	10
4. OBS STUDIO	12
INSTALLATION	12
VIDEO AND AUDIO SETTINGS	15
<i>Video setup.....</i>	<i>16</i>
<i>Audio Setup</i>	<i>18</i>
5. FIRMWARE UPDATE	21
MAIN FIRMWARE UPDATE	21
CAPTURE FIRMWARE UPDATE	25
6. DIMENSIONS	27
7. FREQUENTLY-ASKED QUESTIONS	28
8. SPECIFICATIONS	32
SERVICE AND SUPPORT	36

Disclaimer of Product and Services

The information offered in this instruction manual is intended as a guide only. At all times, Datavideo Technologies will try to give correct, complete and suitable information. However, Datavideo Technologies cannot exclude that some information in this manual, from time to time, may not be correct or may be incomplete. This manual may contain typing errors, omissions or incorrect information. Datavideo Technologies always recommend that you double check the information in this document for accuracy before making any purchase decision or using the product. Datavideo Technologies is not responsible for any omissions or errors, or for any subsequent loss or damage caused by using the information contained within this manual. Further advice on the content of this manual or on the product can be obtained by contacting your local Datavideo Office or dealer.

FCC Compliance Statement

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.

Warnings and Precautions

1. Read all of these warnings and save them for later reference.
2. Follow all warnings and instructions marked on this unit.
3. Unplug this unit from the wall outlet before cleaning. Do not use liquid or aerosol cleaners. Use a damp cloth for cleaning.
4. Do not use this unit in or near water.
5. Do not place this unit on an unstable cart, stand, or table. The unit may fall, causing serious damage.
6. Slots and openings on the cabinet top, back, and bottom are provided for ventilation. To ensure safe and reliable operation of this unit, and to protect it from overheating, do not block or cover these openings. Do not place this unit on a bed, sofa, rug, or similar surface, as the ventilation openings on the bottom of the cabinet will be blocked. This unit should never be placed near or over a heat register or radiator. This unit should not be placed in a built-in installation unless proper ventilation is provided.
7. This product should only be operated from the type of power source indicated on the marking label of the AC adapter. If you are not sure of the type of power available, consult your Datavideo dealer or your local power company.
8. Do not allow anything to rest on the power cord. Do not locate this unit where the power cord will be walked on, rolled over, or otherwise stressed.
9. If an extension cord must be used with this unit, make sure that the total of the ampere ratings on the products plugged into the extension cord do not exceed the extension cord's rating.
10. Make sure that the total amperes of all the units that are plugged into a single wall outlet do not exceed 15 amperes.
11. Never push objects of any kind into this unit through the cabinet ventilation slots, as they may touch dangerous voltage points or short out parts that could result in risk of fire or electric shock. Never spill liquid of any kind onto or into this unit.
12. Except as specifically explained elsewhere in this manual, do not attempt to service this product yourself. Opening or removing covers may expose you to dangerous voltage points or other risks, and will void your warranty. Refer all service issues to qualified service personnel.
13. Unplug this product from the wall outlet and refer to qualified service personnel under the following conditions:

- a. When the power cord is damaged or frayed;
- b. When liquid has spilled into the unit;
- c. When the product has been exposed to rain or water;
- d. When the product does not operate normally under normal operating conditions. Adjust only those controls that are covered by the operating instructions in this manual; improper adjustment of other controls may result in damage to the unit and may often require extensive work by a qualified technician to restore the unit to normal operation;
- e. When the product has been dropped or the cabinet has been damaged;
- f. When the product exhibits a distinct change in performance, indicating a need for service.

Warranty

Standard Warranty

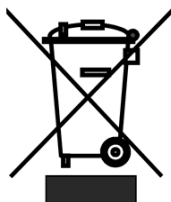
- Datavideo equipment are guaranteed against any manufacturing defects for one year from the date of purchase.
- The original purchase invoice or other documentary evidence should be supplied at the time of any request for repair under warranty.
- The product warranty period begins on the purchase date. If the purchase date is unknown, the product warranty period begins on the thirtieth day after shipment from a Datavideo office.
- All non-Datavideo manufactured products (product without Datavideo logo) have only one year warranty from the date of purchase.
- Damage caused by accident, misuse, unauthorized repairs, sand, grit or water is not covered under warranty.
- Viruses and malware infections on the computer systems are not covered under warranty.
- Any errors that are caused by unauthorized third-party software installations, which are not required by our computer systems, are not covered under warranty.
- All mail or transportation costs including insurance are at the expense of the owner.
- All other claims of any nature are not covered.
- All accessories including headphones, cables, and batteries are not covered under warranty.
- Warranty only valid in the country or region of purchase.
- Your statutory rights are not affected.

Three Year Warranty

- All Datavideo products purchased after July 1st, 2017 are qualified for a free two years extension to the standard warranty, providing the product is registered with Datavideo within 30 days of purchase.
- Certain parts with limited lifetime expectancy such as LCD panels, DVD drives, Hard Drive, Solid State Drive, SD Card, USB Thumb Drive, Lighting, Camera module, PCIe Card are covered for 1 year.
- The three-year warranty must be registered on Datavideo's official website or with your local Datavideo office or one of its authorized distributors within 30 days of purchase.



Disposal



For EU Customers only - WEEE Marking

This symbol on the product or on its packaging indicates that this product must not be disposed of with your other household waste. Instead, it is your responsibility to dispose of your waste equipment by handing it over to a designated collection point for the recycling of waste electrical and electronic equipment. The separate collection and recycling of your waste equipment at the time of

disposal will help to conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment. For more information about where you can drop off your waste equipment for recycling, please contact your local city office, your household waste disposal service or the shop where you purchased the product.



CE Marking is the symbol as shown on the left of this page. The letters "CE" are the abbreviation of French phrase "Conformité Européene" which literally means "European Conformity". The term initially used was "EC Mark" and it was officially replaced by "CE Marking" in the Directive 93/68/EEC in 1993. "CE Marking" is now used in all EU official documents.

1. Product Overview

CAP-1 is an SDI to USB 3.0 Capture Box designed and manufactured by Datavideo for transferring audio and video signals to a computer from an SDI video source like a switcher by converting an SDI video to a USB 3.0 one. The plug and play device is capable of handling up to 1080p60 videos and is compatible with several operating systems.

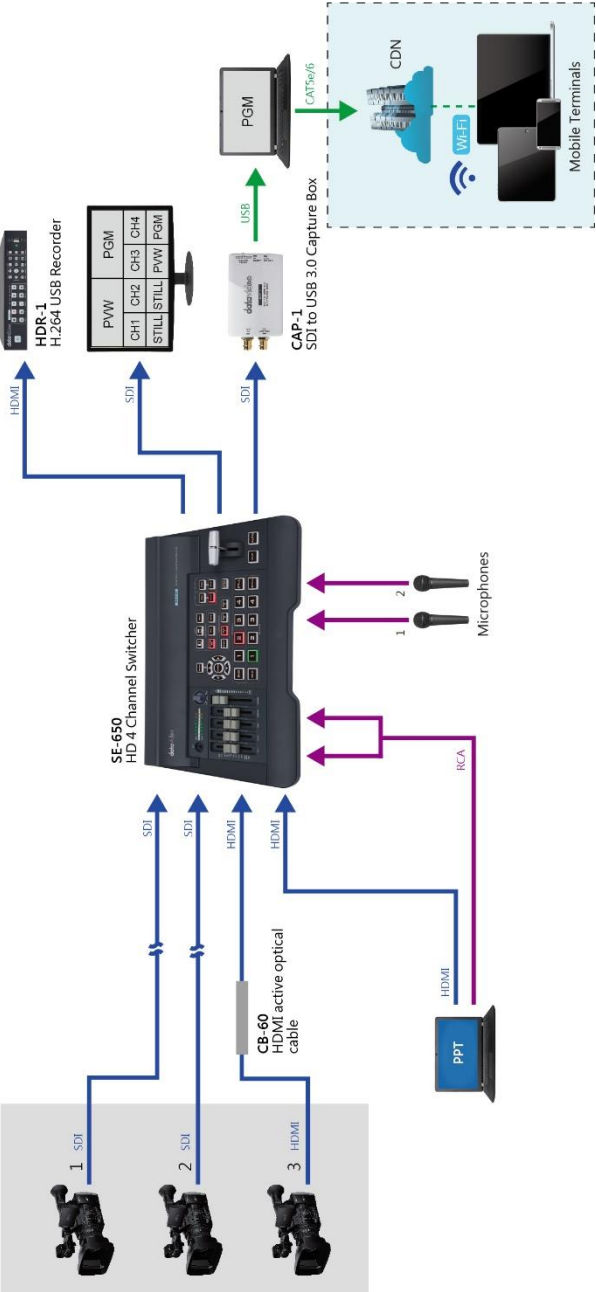
Besides the embedded audio, the AUDIO IN port allows you to connect an external audio source which can be selected using the audio switch, thus providing greater versatility compared to UVC devices.

The USB 3.0 video is usually delivered to the Notebook PC on which various live streaming software can be installed to stream the video to various streaming platforms such as Youtube or Facebook.

Features

- Supports USB 3.0
- Video Input Interface: SDI x 1
- Supports up to 1080p60 video streaming through the USB 3.0 interface.
- Supports SD/HD/3G SDI Audio and Video Capturing
- Supports Plug & Play Operation with Automatic Video Format Detection Capability (Resolution and Frame Rate).
- Compatible with frequently used free Apps including OBS and AMCap
- Supports USB 3.0 (MJPG/YUY2) and USB 2.0 (MJPG)
- On screen display of Input and Output video resolutions (available in main firmware version 2.3 or above)

System Diagram



2. Connections and Control

Front Panel



1. USB 3.0 OUT

Connect the USB 3.0 OUT port to the USB 3.0 interface of your PC or laptop using a USB 3.0 cable.

Note: Only use the Micro USB 3.0 cable provided with CAP-1.

2. AUDIO IN

Connect an external audio source with a 3.5mm male to male stereo audio cable.

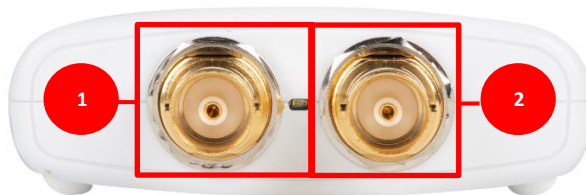
3. AUDIO SWITCH (AUDIO IN/EMBED)

The audio switch allows you to select the audio source. The available options are listed as follows:

Audio IN: The external audio source connected to the Audio IN port.

Embed: The embedded audio of the SDI video source.

Rear Panel



1. SDI IN and LED Indicator

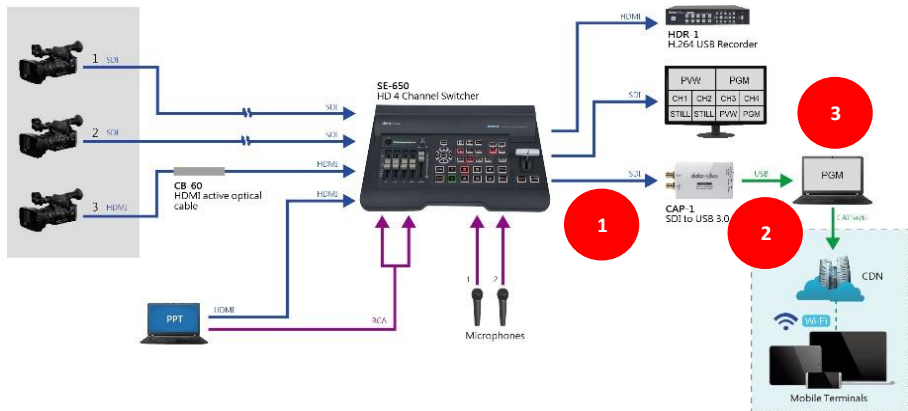
Connect an SDI input source such as a video switcher and the LED indicator should illuminate upon connection.

2. SDI LOOP OUT

SDI Loop out port outputs the video replicated from SDI IN. You can connect an SDI monitor to this port to display the output video.

3. Basic Setup

The diagram below illustrates how CAP-1 is connected in a system.



As shown in the diagram, the CAP-1 should interface between a video source and a video display device. In this case, the video source is the SE-650 switcher and the video display device is a laptop server that streams the video to viewers across a network via OBS Studio. See the next section, [***OBS Studio***](#), for software installation and configuration.

Follow the steps below to connect:

1. Connect the SDI OUT of the SE-650 to CAP-1's SDI IN.

Note: See SE-650's user manual for configuration of the SDI OUT.

2. Connect the CAP-1's USB 3.0 OUT to a USB 3.0 port on the laptop server using a Micro USB-B to USB-A cable

3. Power ON your devices.

Please note that you can also use other live streaming software such as Xsplit Broadcaster to stream the video from the laptop server. The table below summarizes all the software that you can use as well as the operating systems that they can run on.

Datavideo Full Series of Capture Box

CAP-1



CAP-2



Product Name	SDI to USB 3.0 Capture Box	HDMI to USB 3.0 Capture Box
OBS Studio	Windows/Mac OS X/Linux*	
Skype	Windows/Mac OS X/Linux**	
Zoom.us	Windows/Mac OS X/Linux	
AMCap	Windows	
Xsplit Broadcaster	Windows	
Quick Time	Mac OS X	
Google Plus Hangout	Windows	
Teamviewer	Windows	
Media Player Classics	Windows	
Microsoft Teams	Windows/Linux*	
Facetime	Mac OS X	
Potplayer	Windows	
VLC	Windows/Mac OS X/Linux	
Windows	Win7/8.1/10 (The driver is required for Win7)	
Mac OS X	10.13.5/10.14.6 (at least 10.13 or above)	
Linux	Ubuntu 20.04 (at least 14.04 or above)	

*With MAC: A1706, produced in 2018, OS ver.:10.14, it has no audio output.

**When the input resolution is 1080i, the output setting must be 1080p or 720p.

***Microsoft Teams can only output resolution 640x360.

**** The compatibility issue cannot be fixed via hardware or firmware revision. VLC doesn't work smoothly and well on most Windows, MAC OS, and Linux.

4. OBS Studio

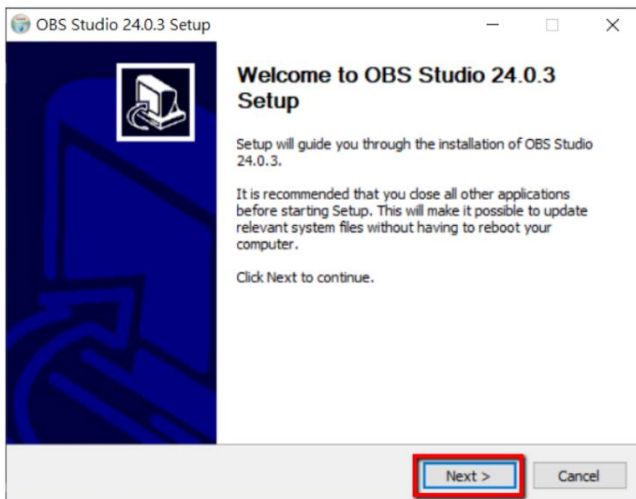
OBS Studio is a piece of free and open software for video recording and live streaming. It is recommended for Windows users. The official download site is <https://obsproject.com/download>.

In this chapter, we will show you how to install OBS Studio and configure the video and audio settings therein.

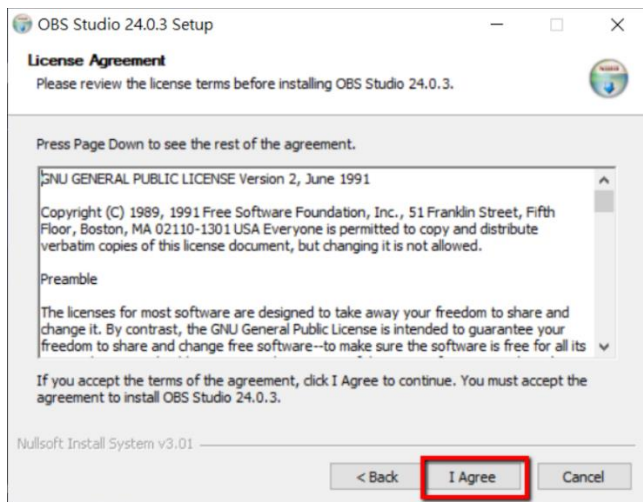
Installation

Follow the steps outlined below to install OBS Studio. Please note that in this example, we will show you how to install OBS Studio on a Windows 10 computer.

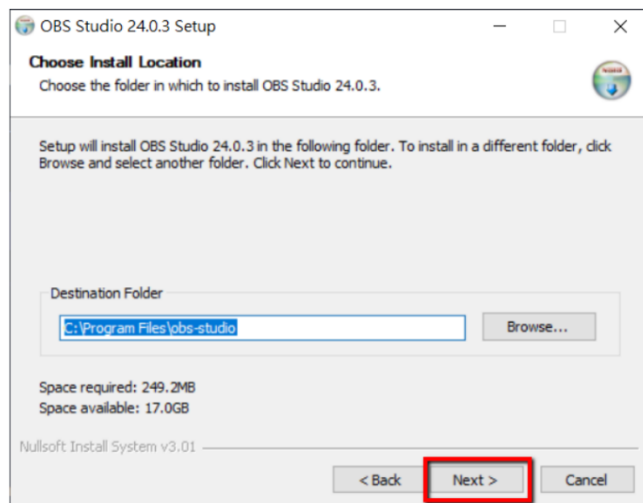
1. Visit the OBS Home (<https://obsproject.com/>) and click the “Windows” button to download the Windows version of the OBS Studio installer.
2. Locate and start the downloaded installer. A welcome page announcing the beginning of installation should appear then click the Next button to proceed with the Setup Wizard.



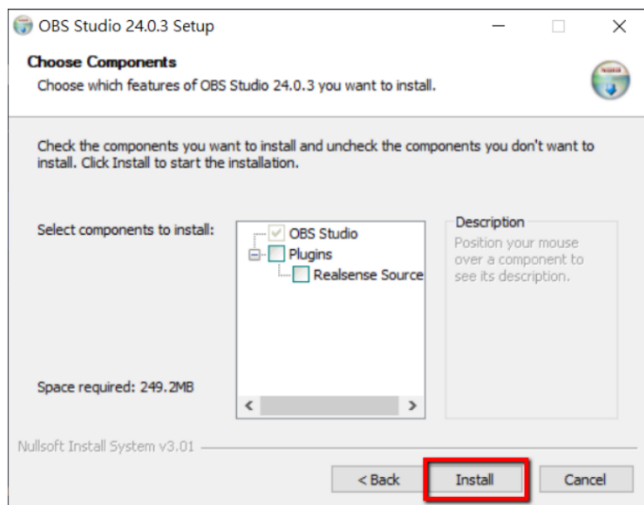
3. View the license agreement then click “**I Agree**” if you accept the terms of the License Agreement and proceed to the next step. To return to the previous step, click the **Back** button. To stop the Setup Wizard, click the **Cancel** button.



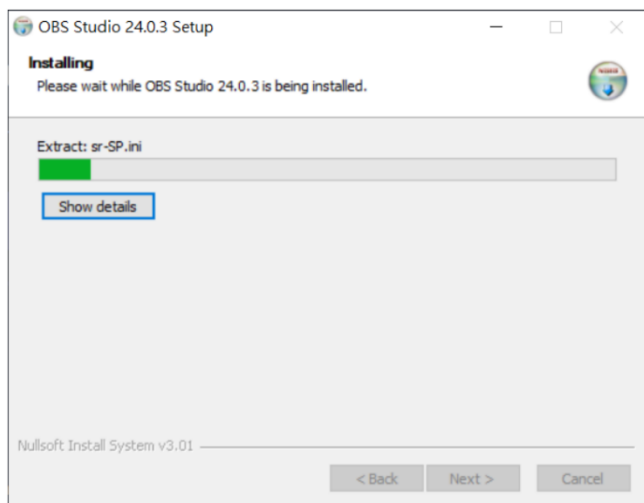
- At this step, specify the path to the destination folder where OBS Studio will be installed. Click the Browse button to select the folder. Disk requirement and status are shown below the destination folder path. To proceed to the next step, click the Next button. To return to the previous step, click the **Back** button. To stop the Setup Wizard, click the **Cancel** button.



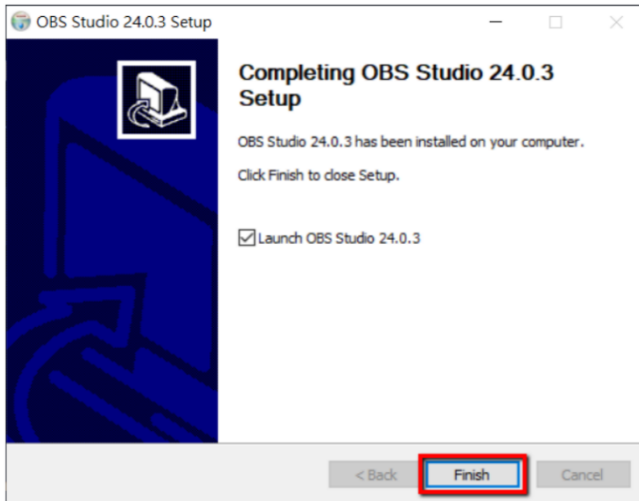
- Select the components of OBS Studio that you would like to install then click “Install” to install the program. To return to the previous step, click the **Back** button. To stop the Setup Wizard, click the **Cancel** button.



6. Installation can take some time. Wait for it to complete.




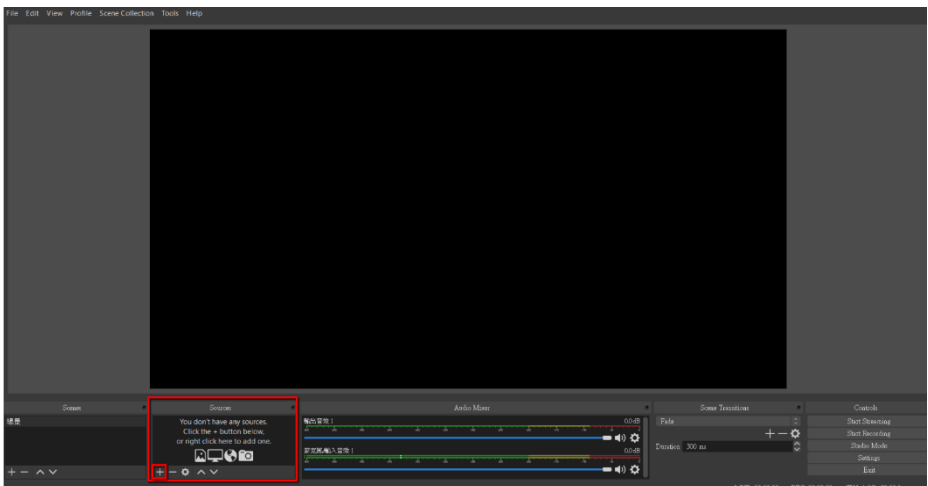
7. After installation finishes, click the “Finish” button to close the setup. If the “Launch OBS Studio 24.0.3” checkbox is checked, OBS Studio should start after the Setup Wizard is closed.



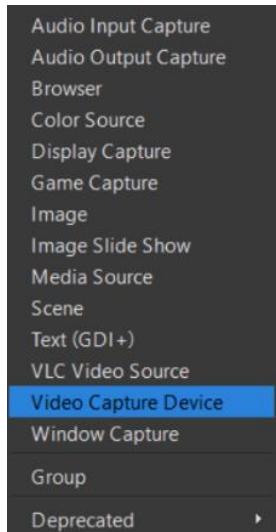
Video and Audio Settings

In this section, we will show you how to select video and audio sources in OBS Studio.

Click the OBS Studio icon to open the program. On the main application window of OBS Studio, at the lower part, locate the Source pane, then click the “Add” button  to open the “Source” menu.



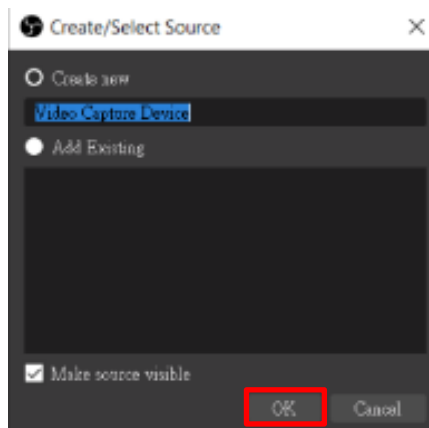
Video setup



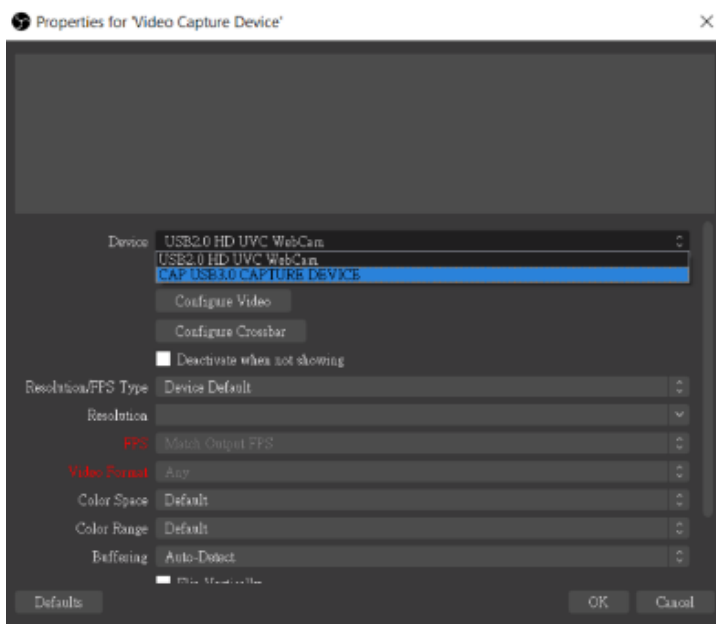
If you are selecting a video source, on the source menu, select **“Video Capture Device”**.

After you’ve selected **“Video Capture Device”**, a **“Create/Select Source”** window should appear, allowing you to enter a name for the video source. In this example, we’ve used the default name, Video Capture Device.

It is recommended to make source visible. Click **OK** to confirm.



Next, on the **“Properties for ‘Video Capture Device’”** window, select **“CAP USB3.0 CAPTURE DEVICE”** from the **“Device”** drop-down menu.



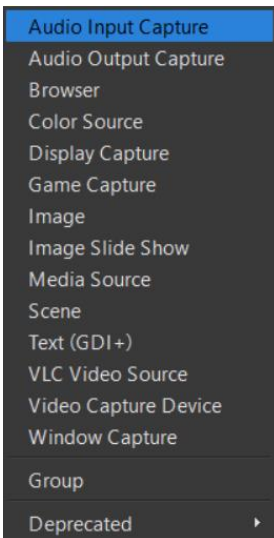
Lastly, on the “**Properties for ‘Video Capture Device’**” window, click OK to display the video delivered from CAP-1 as shown below.



For main firmware version 2.3 or above, you will be allowed to display input and output video resolutions on your display as shown below. Simply open the CAP-1 application software (UVC V1.X) then enable the OSD Status option.



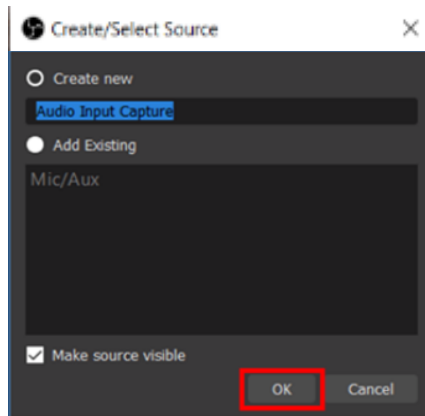
Audio Setup



If you are selecting an audio source, on the source menu, select **“Audio Input Capture”**.

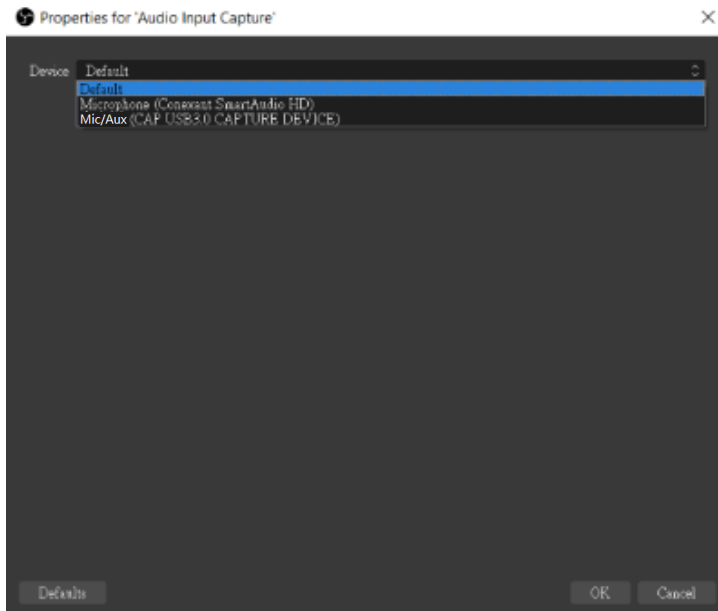
After you’ve selected **“Audio Input Capture”**, a **“Create/Select Source”** window should appear, allowing you to enter a name for the audio source. In this example, we’ve used the default name, Audio Input Capture.

It is recommended to make source visible. Click **OK** to confirm.

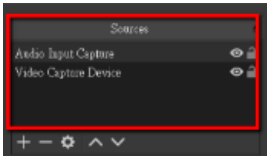


Next, on the “**Properties for ‘Audio Input Capture’**” window, select the audio source from the “**Device**” drop-down menu. The available options are listed as follows:

- **Default:** The embedded audio delivered along with the video from CAP-1.
- **MIC/AUX (CAP USB 3.0 CAPTURE DEVICE):** The external audio source connected to CAP-1.



Lastly, click OK to confirm your audio source selection.



You should be able to see the video and audio sources listed in the Source pane on the main application window after they've been successfully selected.

Note: Visit <https://obsproject.com/wiki/> for more information about OBS Studio.

5. Firmware Update

Datavideo usually releases new firmware containing new features or reported bug fixes from time to time. Customers can either download the CAP-1 firmware as they wish or contact their local dealer or reseller for assistance.

Successful firmware upgrade on CAP-1 requires:

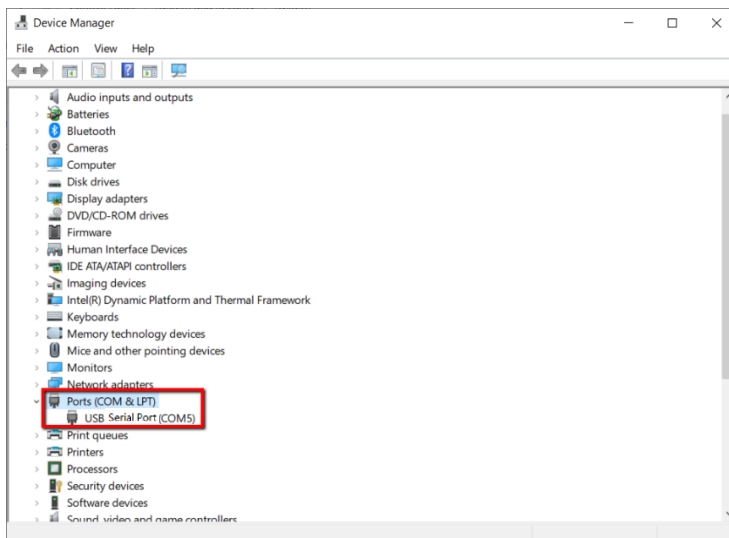
- CAP-1 x 1
- Notebook PC x 1
- USB 3.0 Cable x 1 (Use the cable provided with CAP-1)
- Application Software: UVC V1.X
- Latest firmware files:
 - CAP-1_Main_Vx.x.bin
 - CAP-1_Capture_Vx.x.bin



The main and capture firmware updates are installed independently. See the sections below for respective firmware upgrade procedures.

Main Firmware Update

1. Connect CAP-1 to a Windows laptop using the CAP-1 proprietary USB 3.0 cable.
2. Open “Device Manager” and find the COM port that CAP-1 is connected to in the “Ports” category.



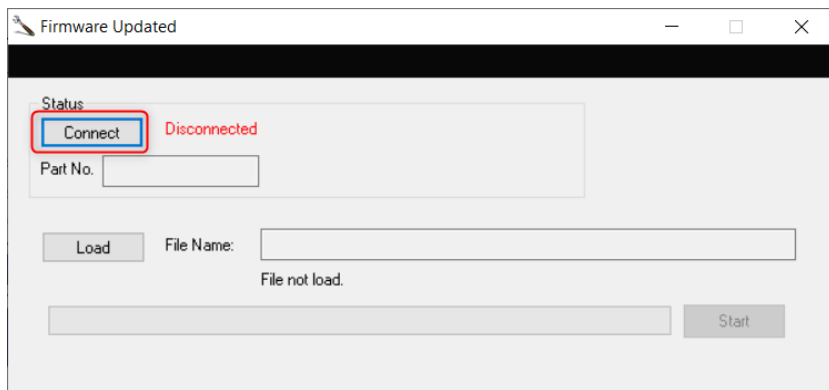
3. Open the CAP-1 application software (UVC V1.X).
4. On the application software, select the correct COM port. Clicking the Read button allows you to view the device's current firmware version numbers.



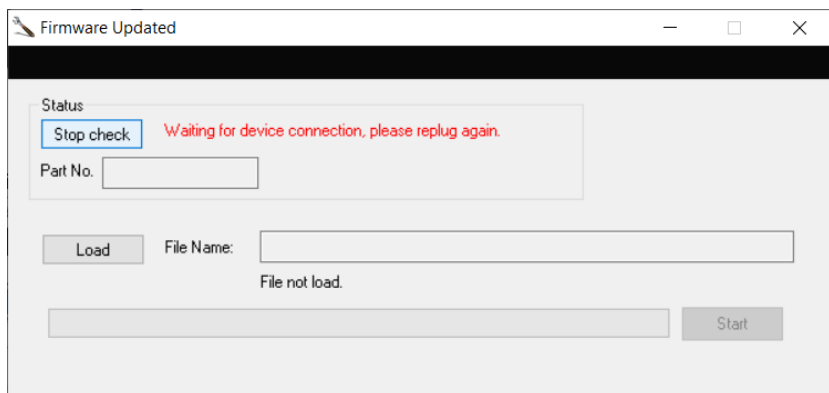
5. Click the Main Updated button to start upgrading the main firmware.



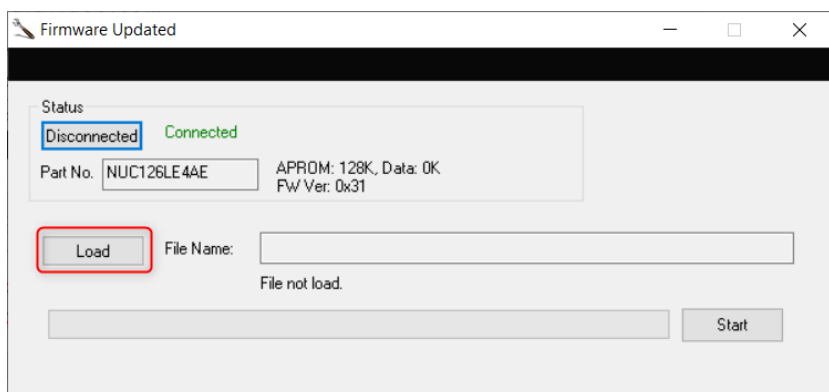
6. When the Firmware Updated window appears, click the Connect button to establish connection with CAP-1.



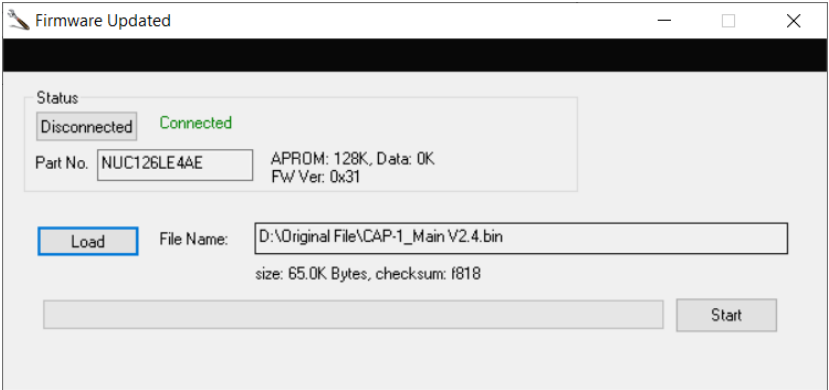
7. Unplug and replug CAP-1.



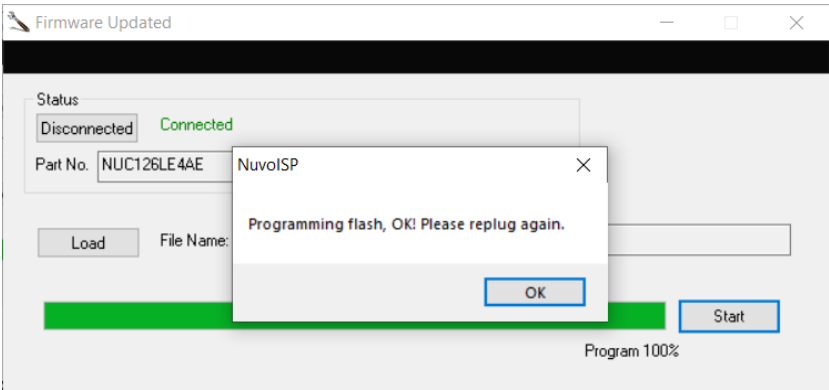
8. After connection is successfully established, click the Load button to import the main firmware file (CAP-1_Main_VX.X.bin) from the local disk.



9. Click the Start button and wait for the progress bar to reaches 100%.



10. When the firmware upgrade process is finished, you will see a pop-up window prompting “Programming flash, OK!”, click the OK button to end the process.



Capture Firmware Update

1. Before upgrading the capture firmware, unplug and replug CAP-1 then open the CAP-1 application software (UVC V1.X).
2. Select the correct COM port then click the Capture Updated button.



3. A command window should appear and the firmware upgrade is completed as soon as you see “Burn Pass” twice in green.

```
C:\Windows\system32\cmd.exe

Burning - SPI ROM Access
  BinFileLength 49152
  Erase Bin file ...

  Write Bin file to ROM
  [OffsetStart : OffsetEnd] 45056 : 49152
  Burn Pass

D:\UVC V1.6\capture\HW_FW_DESC>cd..
D:\UVC V1.6\capture>call 04.Burn_SERIAL.bat
D:\UVC V1.6\capture>cd HW_FW_DESC\
D:\UVC V1.6\capture\HW_FW_DESC>P2pdRomMisc_v4.0.1.1.exe_SER_123456789abcde_SPI_25L12835F.cfg
  Found device: UVC USB3.0 CAPTURE DEVICE [\?\usb#vid_1e4e&pid_7016&mi_00#7&4518fe1&0&00000#{65e8773d-8f56-11d0-a3
b9-00a0c922219c}\global]
  Found device: OBS Virtual Camera ignored
  SET_SERIAL_NUM: index: 0

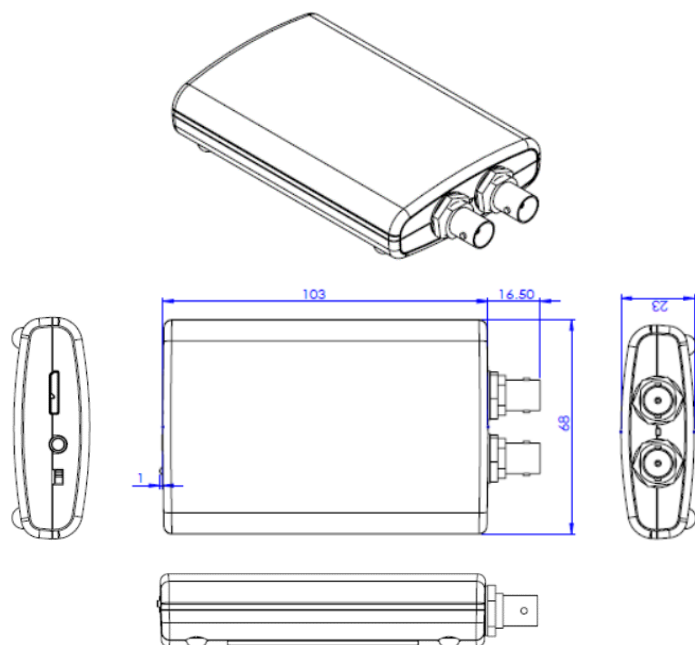
Modify - SPI ROM Access
  Erase Misc sector ...
  [OffsetStart : OffsetEnd] 45056 : 45096
  Burn Pass

D:\UVC V1.6\capture\HW_FW_DESC>pause
Press any key to continue . . .
```

4. Also check the capture firmware version on the application software interface to make sure that the firmware has been successfully updated.




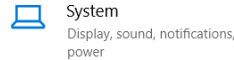
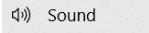
6. Dimensions



Unit : mm

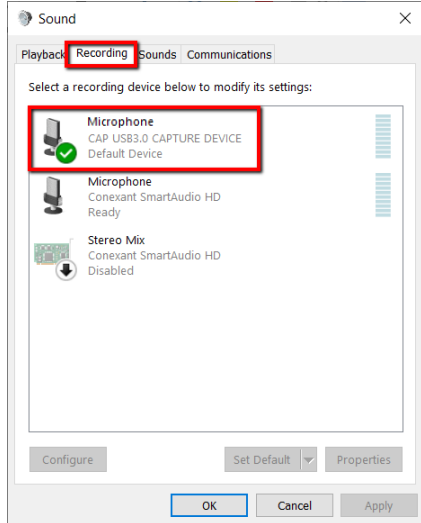
7. Frequently-Asked Questions

This section describes problems that you may encounter while using the CAP-1. If you have questions, please refer to related sections and follow all the suggested solutions. If problem still exists, please contact your distributor or the service center.

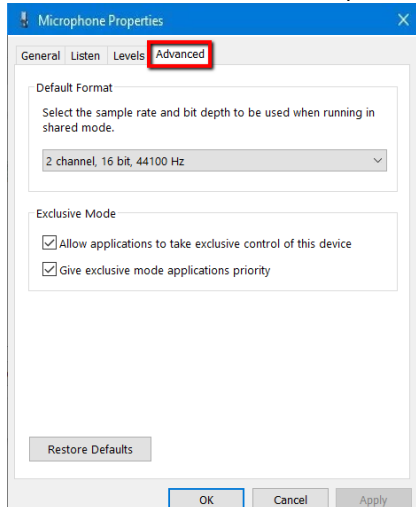
No.	Problems	Solutions
1	CAP-1 cannot be recognized.	First make sure that your OS version is able to recognize CAP-1. See the specifications table for a list of supported OS versions. Make sure you are using the CAP-1 proprietary USB 3.0 cable and the USB port that the CAP-1 is connected to is supplying a minimum of 900mA current.
2	Video stuttering issue	Check the processing power of your computer. Make sure the computer's processing capacity is sufficient to handle your application.
3	The video sent from CAP-1 is not shown on live streaming software such as OBS, Zoom and Skype.	1. Make sure the video source has been powered ON. 2. Make sure the video source has been properly connected to CAP-1's SDI IN. 3. Check whether your computer is already using other live streaming software and occupied by a UVC device.
4	Cannot hear the video sound.	Make sure the audio sample rate is 48 kHz on your operating system. Follow the steps outlined below to check the audio sample rate on Windows 10. 1. Enter Settings in the search bar.  2. Select System  3. Click Sound 

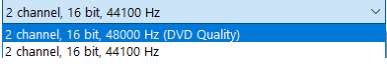



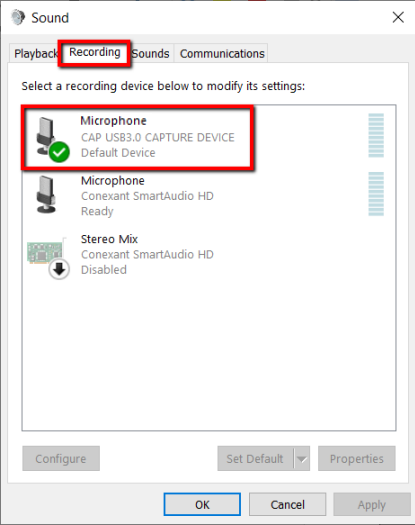
4. In the right column, at the top, click “Sound Control Panel”.

5. Click the Recording tab then select Microphone “CAP USB3.0 CAPTURE DEVICE”.

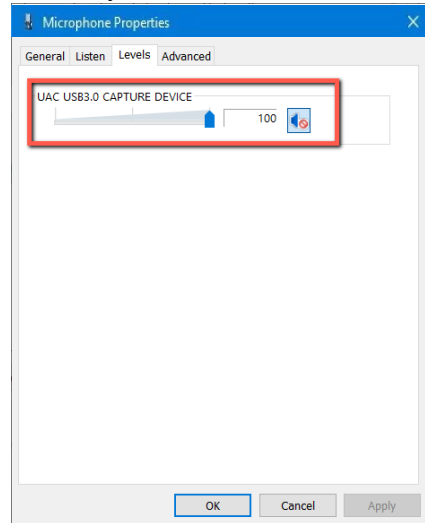


6. Click Properties to open the Properties window then click the Advanced tab to check the sample rate.



		<p>If necessary, you can also set the sample rate to 48 kHz.</p> 
5	Audio level is too low.	<p>Follow the steps below to increase the audio level if you are using a Windows computer.</p> <ol style="list-style-type: none"> 1. Open the Start menu then locate and click the Settings icon . 2. Select System  System Display, sound, notifications, power 3. Click Sound  Sound 4. In the right column, at the top, click “Sound Control Panel”. 5. Click the Recording tab then select Microphone “CAP USB3.0 CAPTURE DEVICE”. 

6. Click Properties to open the Properties window then click the Levels tab to adjust the audio level.



8. Specifications

CAP-1	
Model	CAP-1
Product Name	SDI to USB 3.0 Capture Box
Input	1x HD/3G-SDI
Output	1x USB 3.0 (Micro B) 1x SDI loop through
Input Video Bandwidth	150MHz (pixel clock rate)
Output Video Bandwidth	Up to 350Mbps (USB)
Supported Input Video Formats	1920 x 1080p 60/59.94/50/30/29.97/25/24/23.976 1920 x 1080i 60/59.94/50 (de-interlaced out) 1280 x 720p 60/59.94/50
Supported Output Video Formats	1920 x 1080p 60/59.94/50/30/29.97/25/24/23.976 1920 x 1080i 60/59.94/50 (de-interlaced out) 1280 x 720p 60/59.94/50
Audio Input	SDI Embedded Audio & 3.5 mm stereo in
Audio Format	2-Channel, 16-bit PCM
Captured Video Format	YUY2 (USB3.0), MJPG (USB2.0/3.0)
Firmware Update	Via USB Port
Others	
Software Compatibility	Windows: Amcap, Google Plus Hangouts, OBS (Open Broadcast Software), Skype, VLC, Xsplit Broadcaster, Zoom.us Linux: VLC, OBS Mac OS X: OBS, Quicktime player, VLC, Facetime
Supported OS	Windows® 7(SP1) / Windows 10 / Windows 8.1 / Windows 7 (x86, x64), OS X (10.10 or above), Linux Ubuntu 14.04
Power Supply	Via USB
Power Consumption	3W
Operation Temperature	0~40°C
Storage Temperature	-20~60°C
Humidity	20~90% RH (no condensation)
Mnimum System Requirements	Windows® 7(SP1) / Windows 10 / Windows 8.1 / Windows 7 (x86, x64) Note: The driver is required for Windows 7 OS OS X (10.10 or above)

	Linux Ubuntu 14.04 PC: Intel® Core™ i5-4440 3.10GHz + NVIDIA® GeForce® GTX 660 or higher Laptop: Intel® Core i7-4810MQ + NVIDIA GeForce GTX 870M or higher 4GB RAM or higher
Dimensions	121 x 68 x 23 mm
Weight	92 g

Notes

Notes

Service & Support

It is our goal to make your products ownership a satisfying experience. Our supporting staff is available to assist you in setting up and operating your system. Please refer to our web site www.datavideo.com for answers to common questions, support requests or contact your local office below.

Please visit our website for latest manual update.

<https://www.datavideo.com/product/CAP-1>



@DatavideoUSA @DatavideoIndia2016
@DatavideoEMEA @Datavideojapan
@DatavideoTaiwan @DatavideoLatam
@DatavideoAsia @DatavideoBrasil



@Datavideo
@Datavideo_EMEA
@Datavideo_Taiwan



@DatavideoUSA
@DVTWDVCN



@DatavideoUSA
@DatavideoEurope

All the trademarks are the properties of their respective owners.
Datavideo Technologies Co., Ltd. All rights reserved 2020