Camera User's Guide

Rev 1.2
Leopard Imaging Inc.
Mar, 2014

Preface

Congratulations on your purchase of this product. Read this manual carefully and keep it in a safe place for any future reference.

About this manual

This user manual has been designed to help you make the most of your IP camera and its many features and functions. Information in this document has been carefully checked for accuracy; however, no guarantee is given to the correctness of the contents. The information in this document is subject to change without notice.

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Contents

Introduction

This section covers unpacking your new USB 3.0 camera, its key features, Applications and basic technical information about the Sensor boards. Refer to later chapters for information on setting up and configuring the product in more detail.

Package contents

The package should contain all the following contents. If anything is missing or appears damaged, contact your dealer immediately.

1. USB 3.0 Camera (1)
2. User's Guide (1)
3. Certificate and Warranty Card (1)

1. Product Introduction

1.1 Product outline

Leopard Imaging USB 3.0 camera is new generation super speed USB Video camera which supports more than 3G video bandwidth to stream 1080p 30fps video without compression, it provides sharper and high quality images for scientific and medical industries, Global shutter camera can support high speed conveyor line for machine vision application, lossless image quality and low latency streaming is great for video conference camera industry.

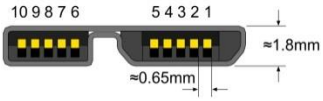
1.2 Key features

- USB 3.0 Super Speed support
- Support Wide range of sensors:
  - M9V024 sensor: Stereo camera for 3-D camera
  - MT9V034 sensor: WVGA Global Shutter RAW data camera
  - MT9M031 sensor: 720p HD Global Shutter RAW data camera
  - MT9M034 sensor: 720p HD WDR camera (YUV with ISP)
  - AR0330 sensor: 1080p30fps camera (YUV with ISP)
  - MT9P031 sensor: 5M RAW data camera
  - Sony ICX285 CCD sensor: CCD Monochrome Camera
  - C570 sensor: e2v EV76C570 2M pixels Sensor
  - C661 sensor: e2v EV76C661 1.3M pixels Sensor
  - AR1820 sensor: Aptina AR1820 18Mp CMOS Sensor
- YUV or RAW data output without compression
- UVC compliance
- USB 2.0 backwards compatible
- Support either CS or M12 lens
- Provide customization services
- USB +5VDC powered device
- Compact Size: 26mmx26mm
- 2 Boards are stacked

1.3 Applications

- Machine Vision
- Video Conference Camera
- Medical Camera
- Scientific Camera
- 3-D Gesture camera

1.4 Device Requirements

Computer	With USB 3.0 Port. The port can be realized via a mainboard-based host adapter or via a separately installed host adapter card
USB cable for USB 3.0 Micro-B Port	 
Operation System	32 bit / 64 bit Microsoft Windows XP SP3 32 bit / 64 bit Microsoft Windows 7 32 bit / 64 bit Microsoft Windows 8 / 8.1
Software	Leopard Imaging Camera Tool GraphEdit AMcap Other video capture software

1.5 Temperature and Humidity

- Housing temperature during operation: 0 ℃ ~ 50 ℃ (32 ℉~ 122 ℉)
- Humidity during operation: 20 % ~80 %, relative, non-condensing
- Storage temperature: -20 ℃ ~80 ℃ (-4 ℉~176 ℉)
- Storage humidity: 20 %~ 80 %, relative, non-condensing

2. Technical Specs

2.1 Main Board

Figure 1: Main Board

Main board mainly includes FX3 USB 3.0 Controller, Power Management, USB 3.0 connector interface, Dual 26-PIN 1.27mm socket for Sensor board interface.

2.2 Sensor Boards

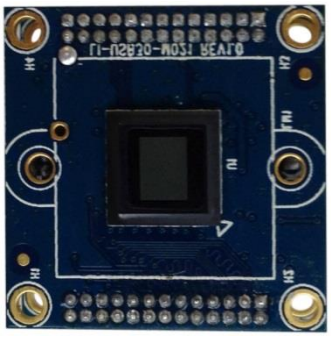


Figure 2: Sensor Board

Leopard Imaging USB 3.0 Camera supports different sensor boards from different manufacturers.

Technical Specs:

LI-USB30-V034	
Sensor	Aptina MT9V034 Global Shutter WVGA Sensor
Active Pixels	752H x 480V
Optical format	1/3"
Pixel size	6.0 um x 6.0 um
Resolution	VGA (640 x 480)
Streaming	Support VGA 60fps video streaming
Global Shutter	For high speed application
Color	Monochrome
Data type	RAW data USB 3.0 real time streaming
Lens	CS / M12 lens mount support (Default: M12 lens)
Interface	USB 3.0 interface
Power	USB 3.0 +5VDC power source
Compact size	26mmx26mm
Part#	LI-USB30-V034
Application	• Machine Vision • Medical Camera • Scientific Camera
LI-USB30-M021	
Sensor	Aptina MT9M021 Global Shutter 720p HD Sensor
Active pixel	1280H x 960V
Optical format	1/3"
Pixel size	3.75 um x 3.75 um
Resolution	720P, VGA (640 x 480)
Streaming	Support 720p, VGA 30fps video streaming
Global Shutter	For high speed application
Data type	RAW data USB 3.0 real time streaming
Lens	CS / M12 lens mount support (Default: M12 lens)
Interface	USB 3.0 interface
Power	USB 3.0 +5VDC power source
Compact size	26mmx26mm
Part#	LI-USB30-M021
Application	• Machine Vision • Medical Camera • Scientific Camera

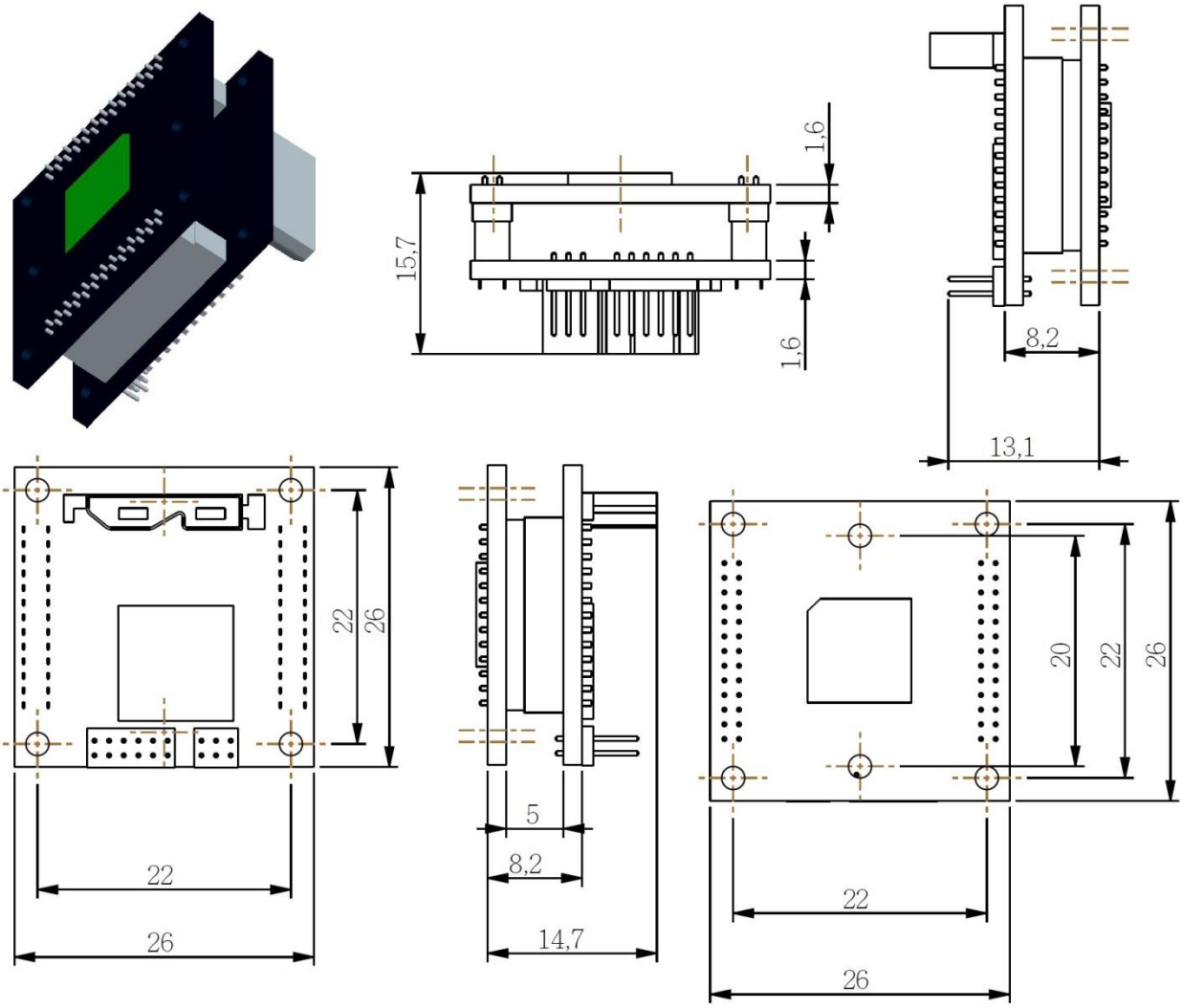
LI-USB30-M034WDR	
Sensor	Aptina MT9M034 720p HD Sensor
Active pixel	1280H x 960V
Optical format	1/3"
Pixel size	3.75 um x 3.75 um
Resolution	960P, 720P, VGA (640 x 480)
Streaming	Support 720p 55fps video streaming Support 960P, VGA 30 fps streaming
WDR	Support WDR (Wide Dynamic Range)
Data type	Tuned YUV data USB 3.0 real time streaming
Lens	CS / M12 lens mount support (Default: M12 lens)
Interface	USB 3.0 interface
Power	USB 3.0 +5VDC power source
Compact size	26mmx26mm
Part#	LI-USB30-M034WDR
Application	• Machine Vision • Medical Camera • Video Conference • Scientific Camera
LI-USB30-AR0330ICP	
Sensor	Aptina AR0330 3Mega-pixel Sensor
Active pixel	2304H x 1536V
Frame rate	30fps
Optical format	1/3"
Pixel size	2.2 um x 2.2 um
Resolution	2304 x 1536, 1080P, 720P, VGA (640 x 480)
Streaming	Support 1080p, 720p, VGA 30fps video streaming Support 2304 x 1536 full resolution 18 fps streaming
Data type	Tuned YUV data USB 3.0 real time streaming
Lens	CS / M12 lens mount support (Default: M12 lens)
Interface	USB 3.0 interface
Power	USB 3.0 +5VDC power source
Compact size	26mmx26mm
Part#	LI-USB30-AR0330ICP
Application	• Machine Vision • Medical Camera • Video Conference • Scientific Camera

LI-USB30-P031	
Sensor	Aptina MT9P031 5M pixels Sensor
Active pixel	2592H x 1944V
Optical format	1/2.5"
Pixel size	2.2 um x 2.2 um
Resolution	2592 x 1944, 1080P, VGA (640 x 480)
Streaming	Support 1080p, VGA 30fps video streaming Support 2592 x 1944 9fps video streaming
Data type	RAW data USB 3.0 real time streaming
Lens	CS / M12 lens mount support (Default: M12 lens)
Interface	USB 3.0 interface
Power	USB 3.0 +5VDC power source
Compact size	26mmx26mm
Part#	LI-USB30-P031
Application	• Machine Vision • Medical Camera • Scientific Camera
LI-USB30-V024STEREO	
Sensor	Aptina MT9V034 Global Shutter WVGA Sensor
Active Pixels	752H x 480V
Frame rate	60fps stereo output
Optical format	1/3"
Pixel size	6.0 um x 6.0 um
Global Shutter	For high speed application
Color	Monochrome
Data type	RAW data USB 3.0 real time streaming
Lens	CS / M12 lens mount support (Default: M12 lens)
Interface	USB 3.0 interface
Power	USB 3.0 +5VDC power source
Compact size	26mmx80mm, Sensor distance: 50 mm
Part#	LI-USB30-V024STEREO
Application	• Machine Vision • Medical Camera • Scientific Camera • 3-D Gesture camera
LI-USB30-C570	
Sensor	e2v EV76C570 2M pixels Sensor
Active pixel	1600H x 1200V

Optical format	1/1.8"
Pixel size	4.5 um x 4.5 um
Resolution	1600 x 1200
Streaming	Support 1600 x 1200 38fps video streaming
Global Shutter	For high speed application
Data type	RAW data USB 3.0 real time streaming
Lens	CS / M12 lens mount support (Default: M12 lens)
Interface	USB 3.0 interface
Power	USB 3.0 +5VDC power source
Compact size	26mmx26mm
Part#	LI-USB30-C570
Application	• Machine Vision • Medical Camera • Scientific Camera
LI-USB30-C661	
Sensor	e2v EV76C661 1.3M pixels Sensor
Active pixel	1280H x 1024V
Optical format	1/1.8"
Pixel size	5.3 um x 5.3 um
Resolution	1280 x 1024
Streaming	Support 1280 x 1024 38fps video streaming
Global Shutter	For high speed application
Data type	RAW data USB 3.0 real time streaming
Lens	CS / M12 lens mount support (Default: M12 lens)
Interface	USB 3.0 interface
Power	USB 3.0 +5VDC power source
Compact size	26mmx26mm
Part#	LI-USB30-C661
Application	• Machine Vision • Medical Camera • Scientific Camera
LI-USB30-AR1820	
Sensor	Aptina AR1820 18M pixels Sensor
Active pixel	4912H x 3684V
Optical format	1/2.3"
Pixel size	1.25 um x 1.25 um
Resolution	4912 x 3684, 1920 x 1080

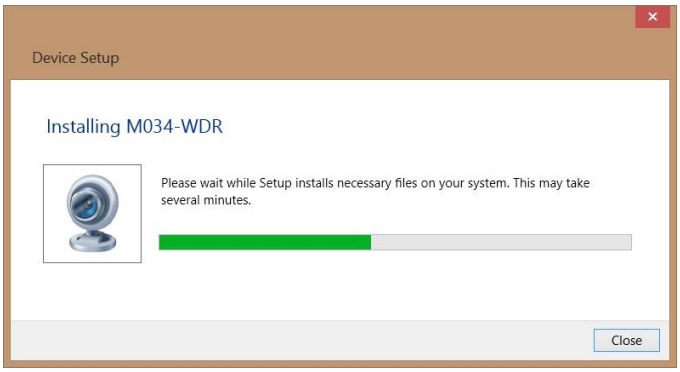
Streaming	Support 4912 x 3684 4 fps video streaming Support 1920 x 1080 30 fps video streaming
Data type	RAW data USB 3.0 real time streaming
Lens	CS / M12 lens mount support (Default: M12 lens)
Interface	USB 3.0 interface
Power	USB 3.0 +5VDC power source
Compact size	26mmx26mm
Part#	LI-USB30-AR1820
Application	• Machine Vision • Medical Camera • Scientific Camera
LI-USB30-CCD285	
Sensor	Sony ICX285 Progressive Scan CCD Image Sensor
Active Pixels	1360H x 1024V
Optical format	2/3"
Pixel size	6.45 um x 6.45 um
Resolution	1360 x 1024
Streaming	Support 1360 x 1024 60fps video streaming
CCD	For high speed application
Color	Monochrome
Data type	RAW data USB 3.0 real time streaming
Lens	CS lens mount support
Interface	USB 3.0 interface
Power	USB 3.0 +5VDC power source
Compact size	32mmx32mm
Part#	LI-USB30-CCD285
Application	• Machine Vision • Medical Camera • Scientific Camera

2.3 Product Dimensions (mm)

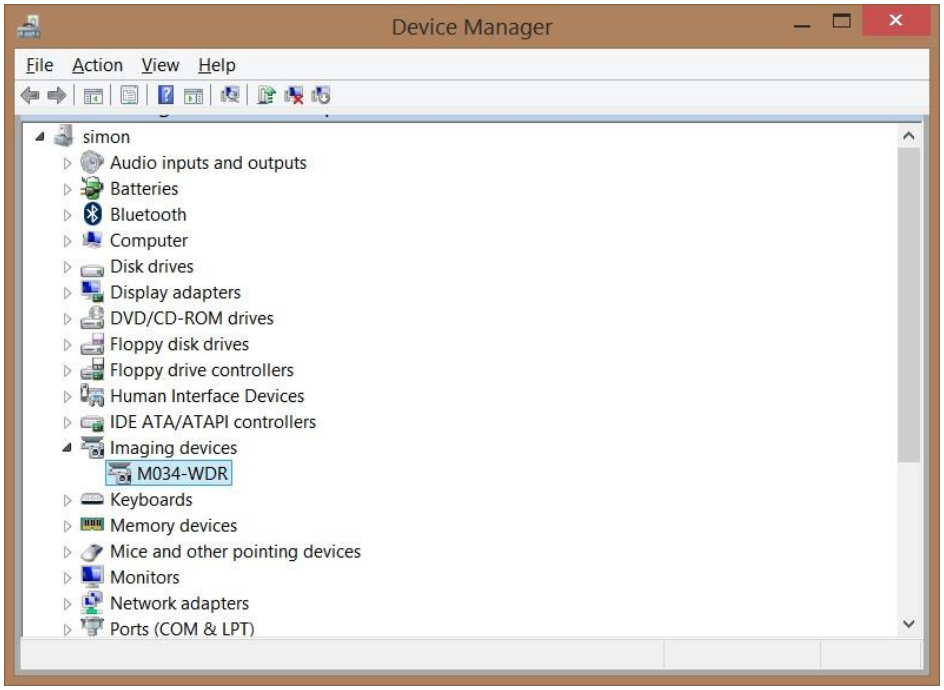


3. Driver Installation

1) Connect the USB 3.0 cable to camera.
2) Plug the USB into USB 3.0 port on PC.
3) PC will search and install driver automatically.



4) After install the driver, you can find it in Device Manager.



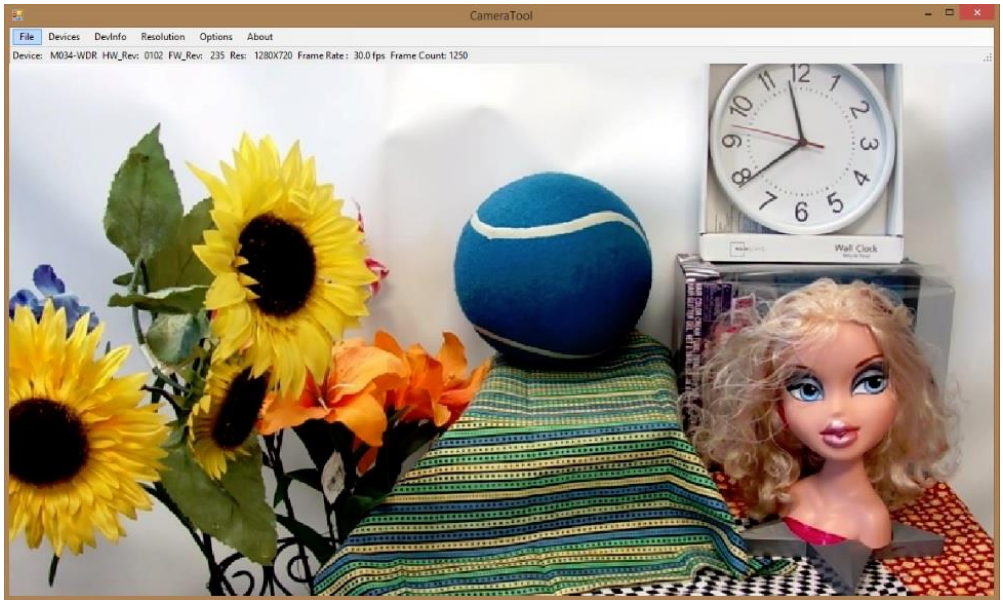
4. Run Camera

4.1 USB 3.0 Camera Tool

1) Download CameraUSB30.zip from link:

   https://www.dropbox.com/sh/ypy5zjdxhowb7bq/gwlh4ANxdr

2) Uncompress the package.
3) Connect the camera to PC.
4) Open "CameraTool.exe".



Note: We also have the SDK for the camera tool software. Please download it from the link below if needed.

https://www.dropbox.com/sh/49cpwx0s70fuich/2e0_mFTJY_

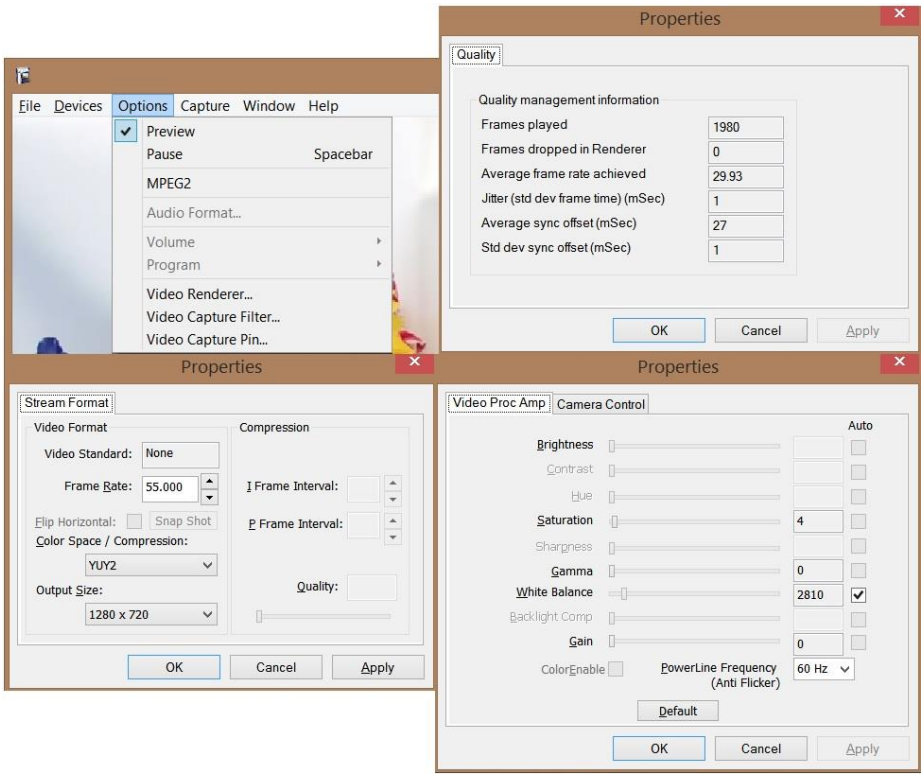
4.2 AMcap

1) Download AMcap from link below.

   http://noeld.com/programs.asp?cat=video

2) Install AMcap.

3) Run AMcap after connecting the camera to PC.

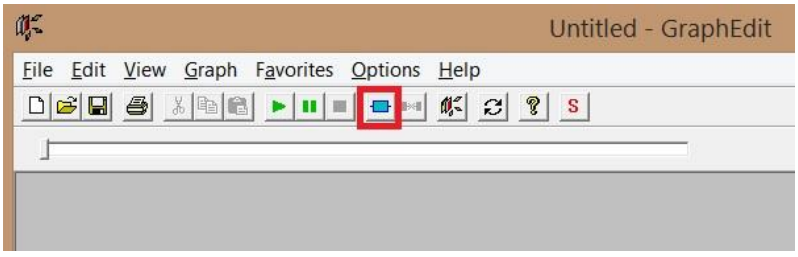


4.3 GraphEdit

1) Download GraphEdit from link below.

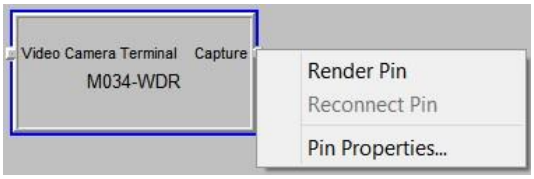
   http://www.videohelp.com/tools/GraphEdit

2) Uncompress the package.
3) Open GraphEdit after connecting the camera to PC. And click"Insert a filter".

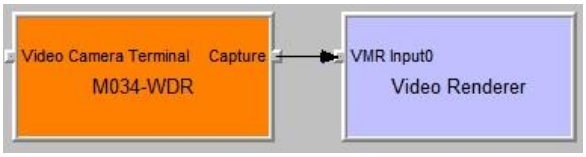


4) Select the camera device and click "inset filter".

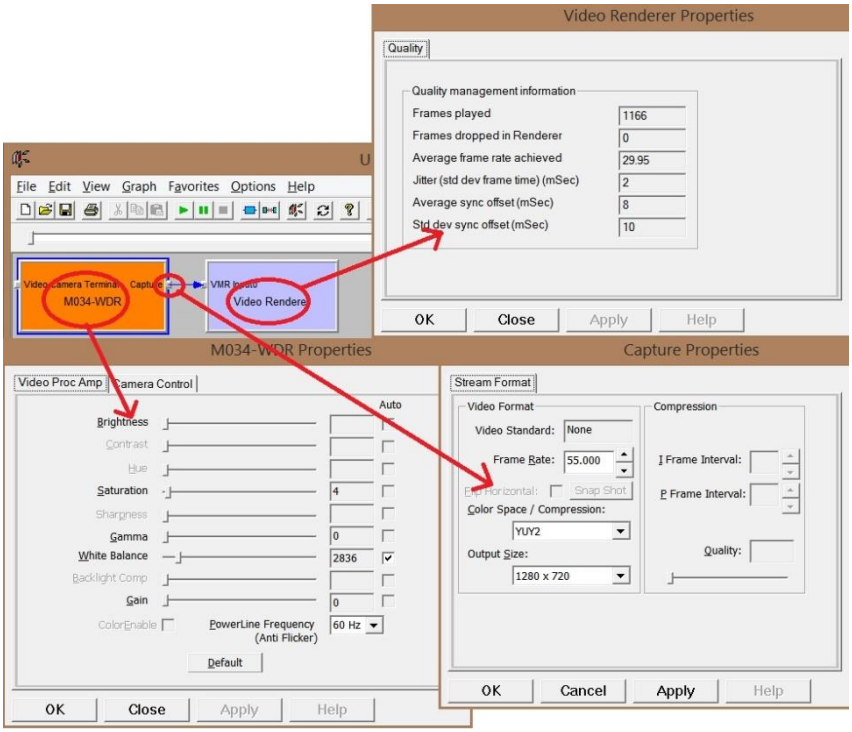
5) Right click "Capture", then click "Pin Properties" to choose a resolution.



6) Right click "Capture", then click "Render Pin".



7) Click "Play the graph". Video window will pop up.

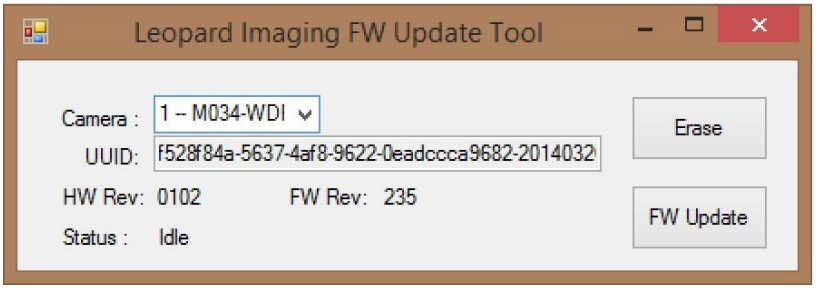


4.4 Other video software

Our USB 3.0 cameras are UVC compliant devices and would be compatible with most of the video capture software (Windows or Linux) which can be downloaded online.

5. Firmware Update

1) Re-connect the USB camera.
2) Open "LP_USB3_FirmwareUpdateTool.exe" which is in the CameraUSB30_x_x.zip package.



3) Click "FW Update" and select the .lif file.
4) Normally the update will complete in around 20 seconds. While the application is updating firmware, you can see the update status in the application window. Once the Firmware update is completed, the status will be updated as "Program Succeeded". Please re-plug the camera before viewing the streaming.

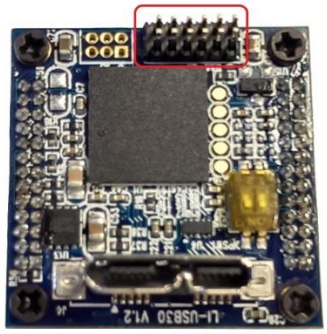
Note: If the driver installation is not successful or if the Status shows as "No Camera", please check whether there's a "WestBridge" under device manager. The driver of "WestBridge" can be downloaded from the link below and updated manually. After the driver is installed correctly, please replug the camera and repeat steps 2) to 4

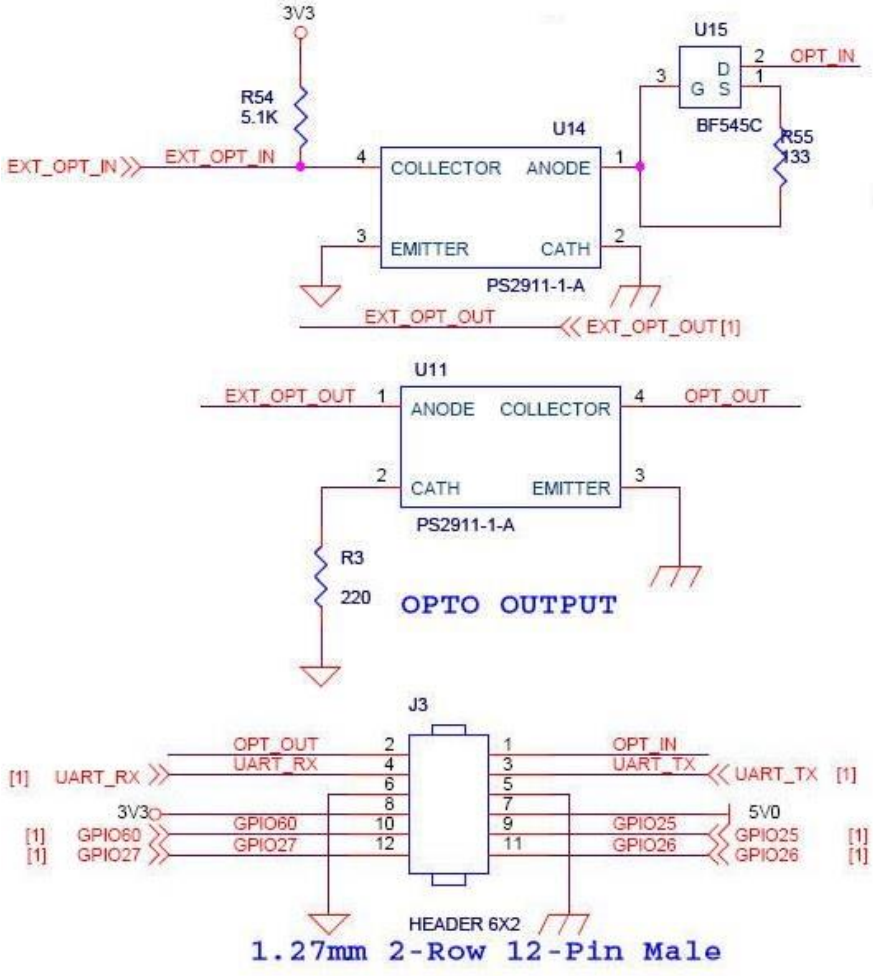
https://www.dropbox.com/s/2tq036z766ct60f/WestBridge_driver.zip

To update the driver manually:

a. right click on "WestBridge" and select Update Driver Software
b. Choose Browse my computer for driver software
c. Click Browse, locate the driver at the downloaded and unzipped folder (C:\temp\driver\bin\ for example)
d. Click next and complete the installation process.

6. Trigger Pin





Hirose HR25-7TR-8SA(73) Pin Assignment:
- Pin1: OPT_IN
- Pin2: OPT_OUT
- Pin3: UART_TX
- Pin4: UART_RX
- Pin5: Field Ground
- Pin6: Digital Ground
- Pin7: External +5VDC
- Pin8: Power Output +3.3VDC