

6.3.1 User interface design

- The menus and toolbars are properly set to ensure quick operation
- Professionally integrated with 5 sidebars - Camera, Folders, Undo/Redo, Layers, Measure
- Comfortable operation method (double-click or right-click context menu)
- Detailed help manual

Figure 23 EHDView video window

6.3.2 Professional Camera Control Sidebar

Capture & Resolution	Set up live and still capture, snap images, or record video
Exposure & Gain	Auto exposure (preset exposure target value), manual exposure (exposure time can be manually entered and set by slider); gain up to 5 times
White Balance	Advanced one-click smart white balance settings, and you can adjust white balance by manually setting color temperature and color
Color Adjustment	Color, saturation, brightness, contrast, gamma initial high-speed adjustment function
Frame Rate Control	For different computer and USB performance, the camera can be super compatible by adjusting the frame rate
Flip	Select "Horizontal" or "Vertical" to adjust the sample orientation to ensure the same orientation as the visual system
Sampling	Neighborhood averaging can improve the signal-to-noise ratio of the video stream; while the sampling extraction mode can ensure the sharpness of the video stream. Supports histogram expansion of video stream, image negative and positive switching, grayscale calibration, and sharpness factor calculation to facilitate video focusing
Bit Depth	8, 12-bit switching, 8-bit is the basic Windows image format. 12-bit has higher image quality but reduces frame rate
Roi	ROI, Region of interest. This function can set the ROI value of the video window. After the ROI group is expanded, a rectangular box will appear in the middle of the video window, and the ROI can be changed. The mouse can adjust the size of the ROI. If there is no problem with the ROI, click "Apply" to set the video to the size of the ROI, and the default value will be restored to the original size.
Dark Field Correction	To enable darkfield correction, you should first capture a field image, then click Enable. Check Enable to enable darkfield correction. Uncheck it to disable darkfield correction
Cooling	Set TEC Target Temperature, fan on/off

Parameter Save	Load, save, overwrite, load, export custom camera panel controls (including calibration information, exposure parameters and color settings information, etc.)
----------------	--

6.3.3 Professional and practical image processing functions

Video Function	Various video professional processing functions: video broadcasting, timing capture, video recording, video watermarking, watermark mobile alignment, watermark rotation alignment, video grid overlay, video measurement, video scaling, gray scale calibration, video high dynamic (HDR), video depth of field extension, video image stitching, video scale, date, etc.
Image Processing and Enhancement	Image contrast control and adjustment, image denoising, various image filtering algorithms, image mathematical morphology algorithms, image rotation, image scaling and image printing, etc.
Image Overlay	The EHDView image overlay denoising function introduces advanced image matching technology. Users only need to record a short video of the image to be superimposed, and they can superimpose and output high fidelity in the case of displacement, rotation and magnification change between multiple frames of the video. images, easy to use

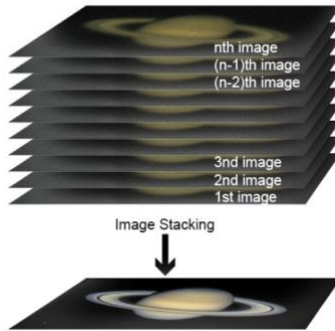


Figure 24 Image overlay denoising

6.3.4 Super compatibility

Camera Video Interface	Provide Twain, DirectShow, Labview, SDK installation package (native C++, C#)
Supported Operating Systems	Compatible with Microsoft® Windows® XP / Vista / 7 / 8 / 10 / 11(32 & 64 bit), Mac OSX, Linux
Language Support	Language support can be added manually, currently supports English, Simplified Chinese, Traditional Chinese, German, Japanese, Russian, French, Italian, Polish, Turkish

6.3.5 Basic hardware requirements

PC Basic Configuration Requirements	CPU: Intel Core 2 2.8GHz or higher
	RAM: 2GB or more
	USB Port: USB3.0 / USB 2.0
	Monitor: 17" or higher
	CD-ROM

6.4 Software development instructions

6.4.1 SDK description

The download link of the SDK is as follows: <https://www.ehd.de/driver/>

6.4.2 SDK support platform

- Win32:
 - x86: XP SP3 and above; the CPU needs to support at least the SSE2 instruction set.
 - x64: Win7 and above.
 - arm: Win10 and above.
 - arm64: Win10 and above.

- WinRT: x86, x64, arm, arm64; Windows 10 and above.
- macOS: x86 and x64 bundle; macOS 10.10 and above.
- Linux: core 2.6.27 and above.
 - x86: The CPU needs to support at least the SSE3 instruction set; GLIBC 2.8 and above.
 - x64: GLIBC 2.14 and above.
 - armel: GLIBC 2.17 and above; compiled by toolchain arm-linux-gnueabi (version 4.9.2).
 - armhf: GLIBC 2.17 and above; compiled by toolchain arm-linux-gnueabi (version 4.9.2).
 - arm64: GLIBC 2.17 and above; compiled by toolchain aarch64-linux-gnu (version 4.9.2).
- Android: arm, arm64, x86, x64; compiled by android-ndk-r18b.

6.4.3 Introduction to SDK content

nncam series cameras support a variety of APIs, including: Native C/C++, .NET/C#/VB.NET, Python, Java, DirectShow, Twain, LabView, Matlab, etc. Compared with other APIs, Native C/C++ API as a low-level API is characterized by using pure C/C++ development without relying on other runtime libraries. The interface is simple and the control is flexible. This SDK zip package contains all the resources and information needed. The directory is as follows:

- inc:
 - nncam.h, the C/C++ header file.
- win: Microsoft Windows platform
 - file
 - ◆ dotnet:
 - nncam.cs, supports C#. nncam.cs uses P/Invoke to call nncam.dll. Please copy nncam.cs to your C# project for use.
 - nncam.vb, supports VB.NET. nncam.vb uses P/Invoke to call nncam.dll. Please copy nncam.vb to your VB.NET project for use.
 - ◆ x86:
 - nncam.lib, x86 lib file.
 - nncam.dll, x86 dynamic library file.
 - democpp.exe, x86 C++ demo execute the procedure.
 - x64:
 - nncam.lib, x64 lib file.
 - nncam.dll, x64 dynamic library file.
 - democpp.exe, x64 C++ demo execute the procedure.
- arm:
 - nncam.lib, arm lib file.
 - nncam.dll, arm dynamic library file.
- arm64:
 - nncam.lib, arm64 lib file.
 - nncam.dll, arm64 dynamic library file.
- winrt:
 - They can be applied for Dynamic library files of WinRT/ UWP (Universal Windows Platform)/ Windows Store App. They are compatible with Windows Runtime and can be referenced by Universal Windows Platform apps. If you use C# to develop UWP, you can use the nncam.cs wrapper class.
 - Please pay attention to the Device Capability of uwp. Refer to how to add USB device capabilities to the

app manifest. (Microsoft seems to limit the Device entry under DeviceCapability to no more than 100) demouwp.zip is a simple example of uwp. Please modify vid and pid. under DeviceCapability in the file Package.appxmanifest before compiling the run example.

- Drivers: (Cameras produced after 2017.1.1 support WinUSB, and drivers no longer need to be installed on Windows 8 and above)

The x86 folder contains the x86 kernel-mode driver files, including nncam.cat, nncam.inf and nncam.sys.

The x64 folder contains the x64 kernel-mode driver files, including nncam.cat, nncam.inf and nncam.sys.
- samples:
 1. democpp, C++ example. This example demonstrates enumerating devices, opening devices, previewing videos, capturing images, setting resolution, triggering, saving images to files in various image formats (.bmp, .jpg, .png, etc.), wmv format video recording, Trigger Mode, IO control and so on. This example uses the Pull Mode mechanism. To keep the code clean, the WTL library used by the examples can be downloaded from this link <http://sourceforge.net/projects/wtl/>.
 2. demopush, C++ example, using the Push Mode mechanism, StartPushModeV3.
 3. demomfc, a simple C++ example, uses MFC as a GUI library, supports opening devices, previewing videos, capturing images, setting resolution, saving images to files in various image formats (.bmp, .jpg, .png, etc.), etc. This example uses the Pull Mode mechanism.
 4. demowinformcs1, take C# winform for example, it supports opening devices, previewing videos, capturing images, saving images to files, and setting white balance. This example uses the Pull Mode mechanism, StartPullModeWithWndMsg.
 5. demowinformcs2, take C# winform for example, it supports opening devices, previewing videos, capturing images, saving images to files, and setting white balance. This example uses the Pull Mode mechanism, StartPullModeWithCallback.
 6. demowinformcs3, take C# winform for example, it supports opening devices, previewing videos, capturing images, saving images to files, and setting white balance. This example uses the Push Mode mechanism, StartPushMode.
 7. demowinformvb, take VB.NET winform for example, it supports opening devices, previewing videos, capturing images, saving images to files, and setting white balance. This example uses the Pull Mode mechanism.
- linux: Linux platform files

Udev: 99-nncam.rules, udev rule file.

Please refer to: http://reactivated.net/writing_udev_rules.html.
- c#: nncam.cs, Support. Net Core C#. nncam.cs uses P/Invoke to call libnncam.so. Please copy nncam.cs to your C# project for use.
- x86: libnncam.so, x86 version so file.
- x64: libnncam.so, x64 version so file.
- armel: libnncam.so, armel version so file, toolchain is arm-linux-gnueabi.
- armhf: libnncam.so, armhf version so file, toolchain is arm-linux-gnueabi.
- arm64: libnncam.so, arm64 version so file, toolchain is aarch64-linux-gnu.
- android: libnncam.so for four architectures of Android platform arm, arm64, x86, x64.
- mac: macOS platform files.
- python: nncam.py and example code.
- java: nncam.java and example code (console and Swing).
- doc: SDK usage documentation, Simplified Chinese, English.
- sample:

- de emosimplest, the simplest example, is about 60 lines of code.
- demoraw, RAW data and still shots, about 120 lines of code.

6.4.4 Third-party interface software

- directshow: DirectShow SDK and demo program.
- twain: TWAIN SDK.
- labview: Labview SDK and demo program.
- matlab: MatLab demo program.
- Micromanager.

7 MaxCam-4040UV-TE Camera CameraLink Port application

7.1 Connection to the CameraLink

Connect the two CameraLink cables: the SDR1 port on the camera is connected to the CL1 port on the capture card, the SDR2 port on the camera is connected to the CL2 port on the capture card.

Attention: if the camera and the acquisition card cross-linking, camera will not work. Please pay special attention.

7.2 Software installation

7.2.1 Install SDK

Windows 10 system can directly select the exe shown in Figure 25 to install SDK; For Windows 7, please install the driver shown in Figure 26.



名称	修改日期	类型	大小
 SaperaLTSDKSetup_8.60.exe	2023/4/28 13:49	应用程序	413,617 KB
 Xtium2-CL MX4.pdf	2023/4/28 13:59	Microsoft Edge ...	4,426 KB
 xtium-cl_mx4_130000311.exe	2023/4/28 13:49	应用程序	43,574 KB

Figure 25





 SaperaLTSDKSetup_8.60.exe	2023/4/28 13:49	应用程序	413,617 KB
 Windows6.1-KB3033929-x64.msu	2023/8/24 10:37	Microsoft 更新独...	44,843 KB
 Xtium2-CL MX4.pdf	2023/4/28 13:59	Microsoft Edge ...	4,426 KB
 xtium-cl_mx4_130000311.exe	2023/4/28 13:49	应用程序	43,574 KB

Figure 26

7.2.2 Install options

The following is the interface to be selected, and the rest of the steps can be directly clicked next.

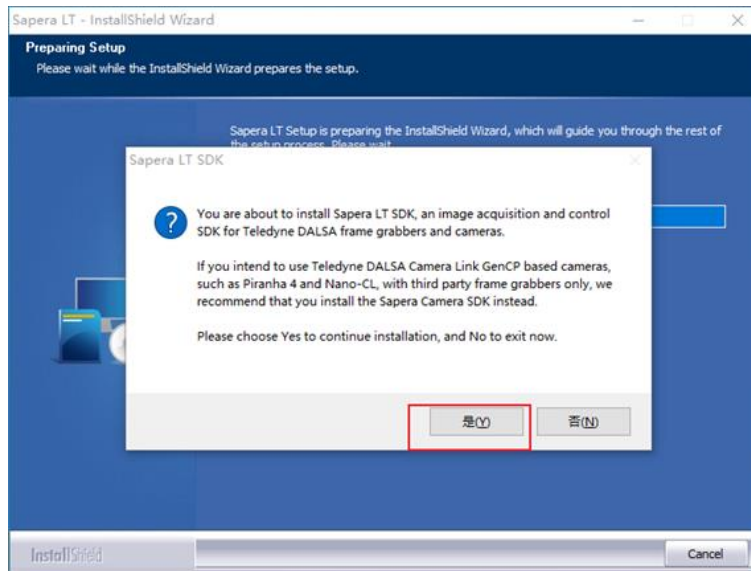


Figure 27

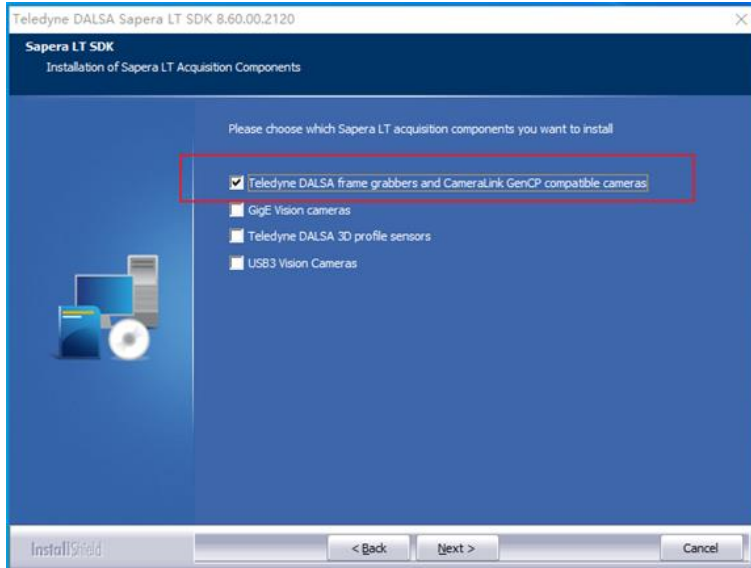


Figure 28

7.2.3 Install the driver

The exe shown in Figure 29 is the driver of the capture card (xtium-cl_mx4) currently used by our company, and the drivers of dalsa acquisition cards are different.

Capture card driver installation steps can be all click Next.

SaperaLTSDKSetup_8.60.exe	2023/4/28 13:49	应用程序	413,617 KB
Xtium2-CL MX4.pdf	2023/4/28 13:59	Microsoft Edge ...	4,426 KB
xtium-cl_mx4_130000311.exe	2023/4/28 13:49	应用程序	43,574 KB

Figure 29

Restart your computer after the installation is complete.

7.3 Configure the Dalsa capture card

7.3.1 Serial port configuration

Find the software Sapera Configuration in Figure 30 of the DALSA supporting tool, open it, change COM port mapping (optional) to the required port (currently COM2) as shown in Figure 31, and restart the computer according to the program requirements.

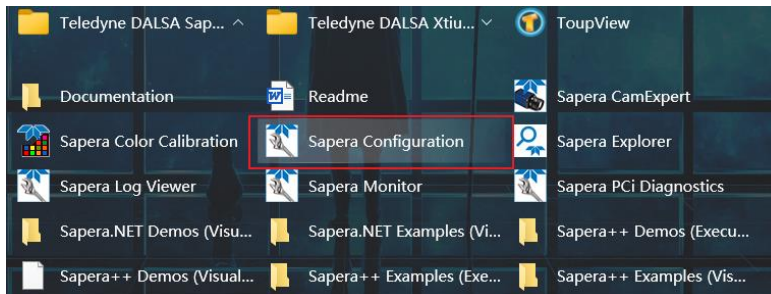


Figure 30

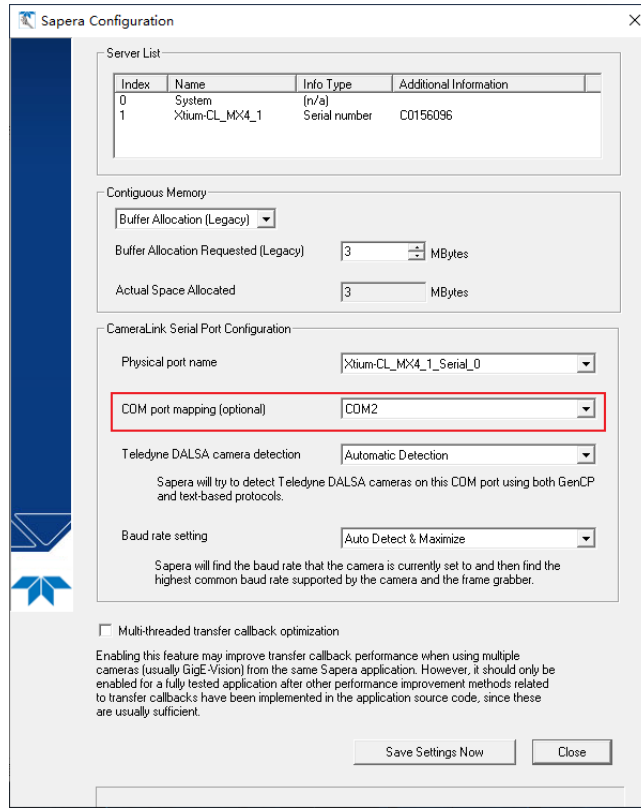


Figure 31 Serial port configuration dialog box

7.3.2 CameraLink mode configured

Open the software in Figure 32 and verify that it looks like Figure 33. If not, please click the Manual button in Figure 20 to modify the tart as shown in Figure 34, and click the tart Updat button to wait for the completion of the update. If an error occurs, please confirm whether the serial port control is turned off.

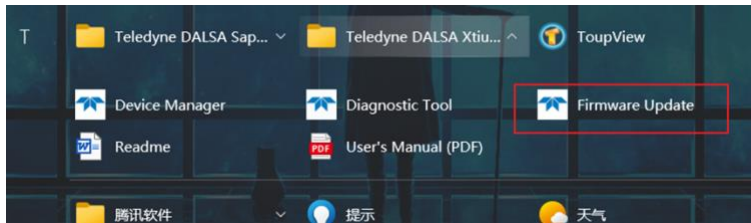


Figure 32

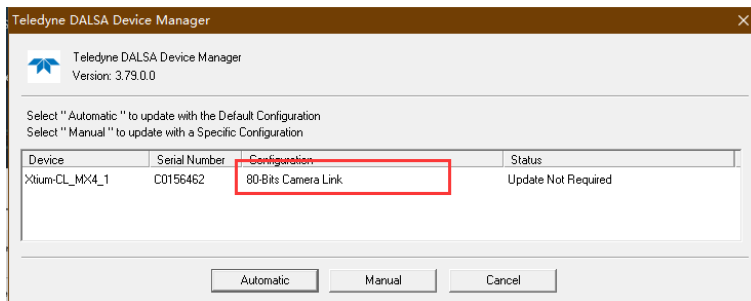


Figure 33

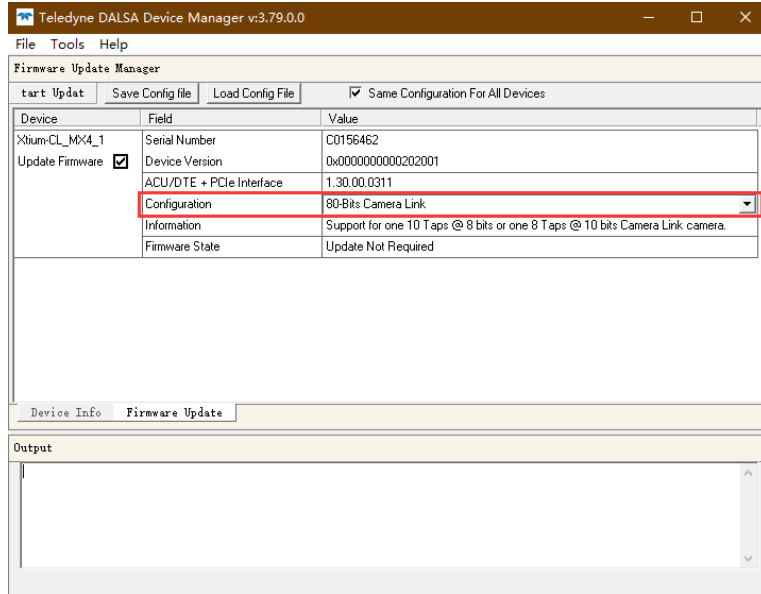


Figure 34

7.3.3 Configuring CameraLink Receiving

Opening the Spera CamExpert software of DALSA, click the arrow position in Figure 35 and select MaxCam-4040UV-TE_CL_10bit_8Ports_V1.0.ccf to load the configuration information of the receiving format of CameraLink.

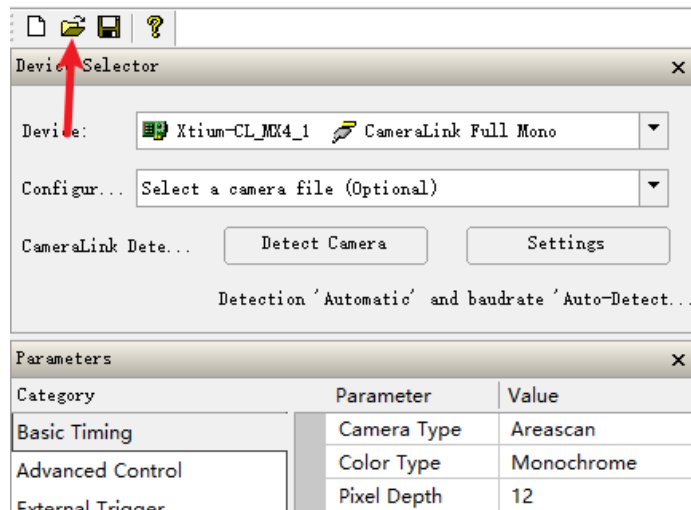


Figure 35 Load the CameraLink receive format configuration information

The arrangement is shown in Figure 36(You do not need to change the arrangement of the ccf files mentioned above).

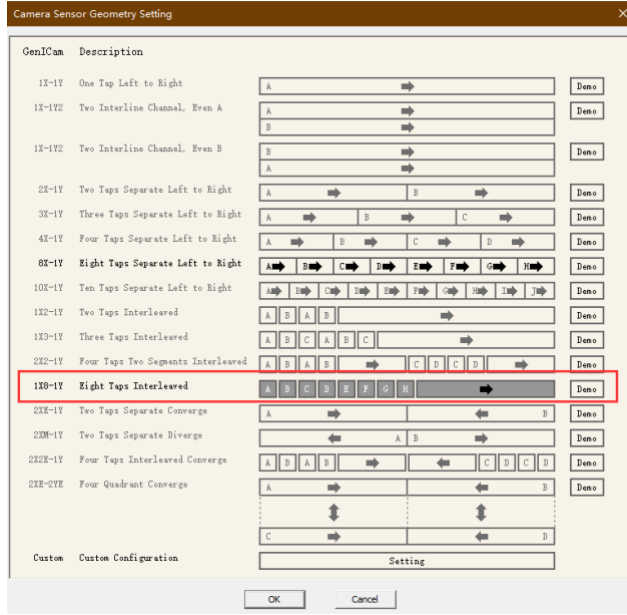


Figure 36 Arrangement

7.3.4 CameraLink Receiving the configuration content

The image below shows the resolution and bit depth Settings.

Parameter	Value
Camera Type	Areascan
Color Type	Monochrome
Horizontal Activ...	2048
Horizontal Offs...	0
Vertical Active (...)	2048
Vertical Offset (...)	0
Pixel Clock Inp...	85
Camera Sensor...	1X8-1Y
PoCL	Disabled
PoCL Status	Not Active

Figure 37

The steps of Camera Sensor Geometry Setting are shown in Figure 38 and Figure 39.

Parameter	Value
Camera Type	Areascan
Color Type	Monochrome
Horizontal Activ...	2048
Horizontal Offs...	0
Vertical Active (...)	2048
Vertical Offset (...)	0
Pixel Clock Inp...	85
Camera Sensor...	1X8-1Y
PoCL	Disabled
PoCL Status	Not Active

Figure 38

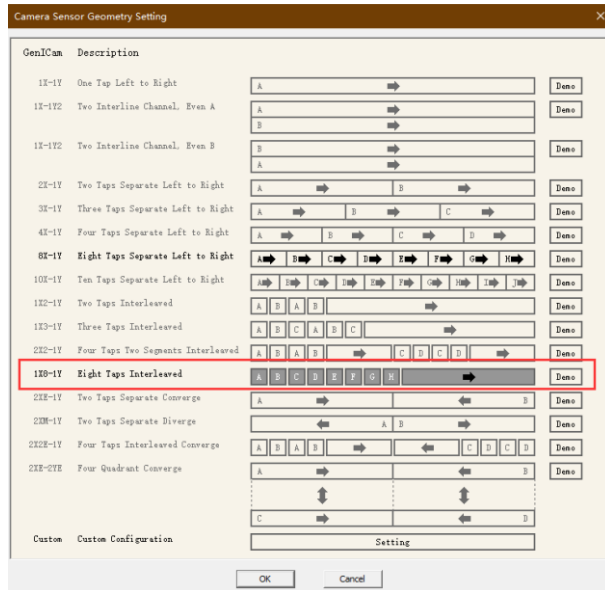


Figure 39

7.4 Using GenIcam

7.4.1 Communication Settings

Enter the interface shown in Figure 40 and set the content as shown in Figure 41.

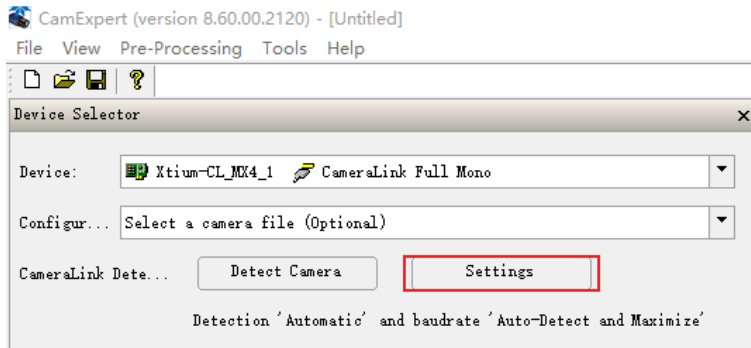


Figure 40

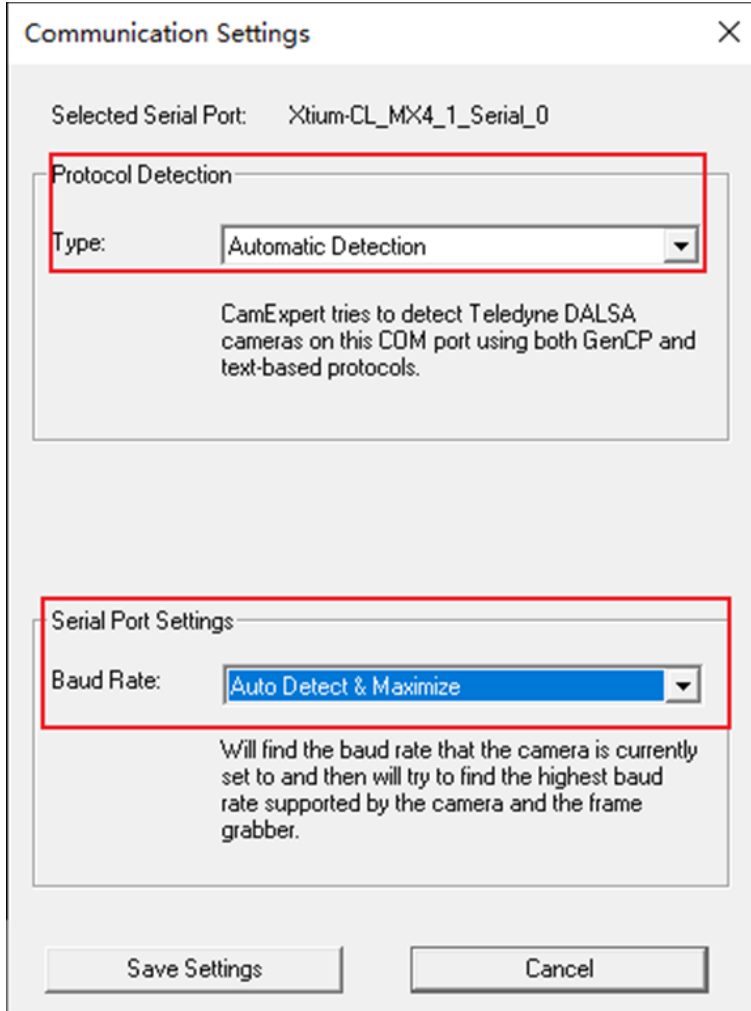


Figure 41

After the Settings are complete, properly connect the camera and restart CamExpert. Figure 42 will appear on the software interface.

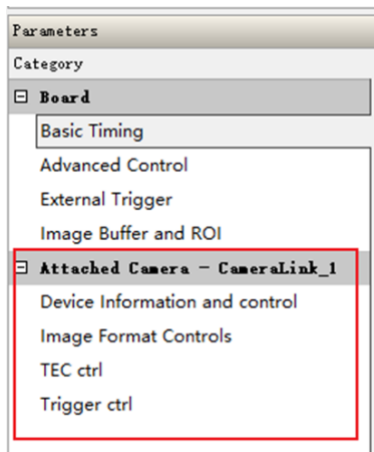


Figure 42

7.5 Description of GenIcam

7.5.1 Device Information and control

As shown in Figure 43, it contains the basic information of the equipment, including exposure time control, gain control, frame rate control and TEC temperature display.

Category	Parameter	Value
Board	Manufacturer ...	touptek hangzh
Basic Timing	Device Family	toupswir
Advanced Control	Model Name	toupswir331k
External Trigger	Serial Number	...
Image Buffer and ROI	expo time	100
	gain	Middle Gain
Attached Camera - ...	Frame Frequency	700
Device Information and ...	Deniose mode ...	Enable
Image Format Controls	Deniose level	5
TEC ctrl	TEC_temp	0.4
Trigger ctrl	Show More >>	

Figure 43

7.5.2 Image Format Controls

Figure 44 shows the ROI control.

Parameters		
Category	Parameter	Value
Board	Horizontal Offset	0
Basic Timing	Vertical Offset	0
Advanced Control	Width	640
External Trigger	Height	512
Image Buffer and ROI	Show More >>	
Attached Camera - CameraLink_1		
Device Information and control		
Image Format Controls		
TEC ctrl		
Trigger ctrl		

Figure 44

7.5.3 TEC Ctrl

As shown in Figure 45, TEC Ctrl contains TEC temperature control, TEC switch, fan switch, and TEC temperature display in degrees Celsius.

Category	Parameter	Value
Board Basic Timing Advanced Control External Trigger Image Buffer and ROI	set temp	0.0
	TEC mode select	Enable
	Fan mode select	Enable
	TEC_temp	-1.5
Show More >>		
Attached Camera - ... Device Information and ... Image Format Controls TEC ctrl Trigger ctrl		

Figure 45

7.5.4 Trigger ctrl

The trigger control content Settings are shown in Figure 46 and contain the basic trigger Settings.

Parameters		
Category	Parameter	Value
Board Basic Timing Advanced Control External Trigger Image Buffer and ROI	Tri mode	Disable
	Softalways	Disable
	TriSource	Opt_in
	TriActivation	rising edge
	Burst Counter	0
Attached Camera - ... Device Information and ... Image Format Controls TEC ctrl Trigger ctrl	CounterSource	Opt_in
	Counter Value	0
	PWMSource	Opt_in
	Soft trigger	Disable
	Triggger Delay0	0
	Triggger Delays	0
	Output Mode0	0
	DurationTime	0
	PreDelay	0
	OutputDelay	0
	UserValue	Opt_in
	TriProhibited	4100
	Counter Reset	Disable
	Debounce0	0
	Line Inverter	-Invalid value-
OutputCounter	1	

Figure 46

7.6 Camera Commands

7.6.1 Basic Formats

The serial port of the camera CameraLink is used as the communication port. The baud rate of the serial port is 115200, and the serial port has 8 bits without check bit mode.

The protocol format is compatible with GENICAM genepc 1.0. For details, refer to GENICAM protocol.

The protocol instruction is realized by register access, each function is distinguished and defined by different register addresses, and the protocol data is divided into general part and special part. The protocol data is preceded by the general part and followed by the special part. The general part is fixed to the length of 16 bytes, and the length of the special part is variable according to the different length of the function.

The general 16-byte format is described as follows (all fields in the general part are in Big-Endian format with high bytes before them) :

Suppose the sixteen bytes of data are D0, D1, D2, D3, D4, D5, D6, D7, D8, D9, D10, D11, D12, D13, D14, D15. For command execution, the protocol stipulates that the host computer is the active initiator and the device is the passive responder.

1. D0, D1 is two prefix bytes, fixed as 0x01 and 0x00.
2. D2 and D3 are the check words of the universal partial data. The check part ranges from D6, D7 to D14, and D15 adopts double-byte CRC redundancy check, with the high byte coming first (Big-Endian).
3. D4 and D5 are the check words for the total protocol data. The check part runs from D6 and D7 to the end of the entire protocol data. Double-byte CRC redundancy check is also adopted, with the high byte in the front (Big-Endian).
4. D6 and D7 are channel ids. At present, the device channel is fixed to 0, and the data is 0x00 and 0x00.
5. D8 and D9 are common flag fields. For the upper computer, if the value is 0x40, 0x01 indicates that the normal function request is sent and the device needs to respond. If the value is 0x00, 0x01 indicates that the normal function request is sent and the device does not need to respond. For the response of the device, the field is 0x00. 0x00 indicates that the device receives the response correctly and there is no exception.
6. D10 and D11 are command ids, which are general command definition fields. For the upper computer, the values are 0x08 and 0x00 when reading data and 0x08 and 0x02 when writing data. For the device, the value is 0x08, 0x01 when it responds to read data, 0x08, 0x03 when it responds to write data.
7. D12, D13 indicates the length of the dedicated part data.
8. D14 and D15 are sequence ids. For the upper computer, the sequence ID needs to be increased by one for each command sent. The sequence ID remains the same for a device-side response to ensure that the host machine receives confirmation that the device-side instruction is executed correctly.

7.6.2 Dedicated Part Format

For the special part of the format is mainly divided into two read and write registers (register and length field is fixed in the Big-Endian format before the high byte, the rest of the data can be Big-Endian or Little-Endian, according to the custom)

1. Format description of the special part when the upper computer reads the register data

The whole dedicated data length is 12 bytes, if the data is R0, R1, R2, R3, R4, R5, R6, R7, X0, X1, X2, X3, where R0~R7 is the register address that needs to be read; X0, X1 is fixed to 0x00, 0x00; X2, X3 are the length of the data to be read (the length is the legal length defined by the register, and the length of each register is specified).

2. Format description of the special part when the device responds to the upper computer reading register data

The whole private data is the data that needs to be read, there are no other fields; The length varies according to the length of the data read, such as X1, X2, X3..... Xn; The length of the read data is n.

3. Format description of the special part of the upper computer when writing register data

When the upper computer writes register data, the special part of the data consists of two parts: register and data, such as R0, R1, R2, R3, R4, R5, R6, R7, X1, X2, X3..... Xn; R0 to R7 indicates the register address (REG_ADDR). X1 to Xn indicates the data to be written. The length of the data to be written is n, which is the legal length specified by the register.

4. Format description of the special part when the device responds to the host computer to write register data

When the device successfully writes data from the host computer, the dedicated data part of the device response is fixed as 0x00, 0x00, 0x00, 0x00.

7.6.3 Definition of each register

ADDR_BASE = 0x0000000020000000

REG_ADDR = ADDR_BASE + ADDR_OFFSET

Number	Register function	Register address (ADDR_OFFSET)	Register value	default parameters	data length	R/W	Data sequence
1	ROI columns	0x070	0-2047	0	4byte	RW	little
2	ROI column starting position	0x080	0-2047	2048	4byte	RW	little
3	ROI rows	0x090	0-2047	0	4byte	RW	little
4	ROI row starting position	0x0A0	0-2047	2048	4byte	RW	little
5	Exposure	0x200	16~100000(us)	100	4byte	RW	Big
6	Gain	0x230	1~700	700	4byte	RW	Big
7	Frame rate control	0x280	1~10	5	4byte	RW	Big
8	Denoising level	0x330	T (°C) = data/10, 二进制补码	0	4byte	RW	Big
9	Algorithm control	0x340	T (°C) = data/10, 二进制补码		4byte	R	Big
10	Defective pixel reload	0x350	1 为开, 0 为关	1	4byte	RW	Big
11	TEC Temperature Setting	0x360	1 为开, 0 为关	1	4byte	RW	Big
12	TEC temperature reading	0x390	1 为开, 0 为关 (暂不支持)	0	4byte	RW	Big
13	TEC switch control	0x400	0-Normal Mode 1-Trigger Mode	0	4byte	RW	Big
14	Fan control	0x410	0-soft disable 1-soft always enable	0	4byte	RW	Big
15	Automatic dark field switch	0x420	trigger source: 0-Opt_in 1-GPIO_0 2-GPIO_1 3-counter 4-PWM 5-software	0	4byte	RW	Big
16	Manual dark field selection	0x430	0-rising edge; 1-falling edge; 2-level high; 3-level low	0	4byte	RW	Big
17	Auto exposure switch	0x440	continuous acquisition 0-65535	0	4byte	RW	Big
18	tri_mode	0x450	0-Opt_in 1-GPIO_0 2-GPIO_0	0	4byte	RW	Big
19	soft always en	0x460	Frequency division	0	4byte	RW	Big

			coefficient				
20	tri_source_i	0x470	0-Opt_in 1-GPIO_0 2-GPIO_1	0	4byte	RW	Big
21	tri_activation_i	0x430	0bit: GPIO_0: 0-input,1-output 1bit: GPIO_1: 0-input,1-output	0	4byte	RW	Big
22	burst_counter_i	0x440	software trigger	0	4byte	W	Big
23	counter_source_i	0x450	when the Opt_in trigger assert, the start of exposure will delay 0-32xffff_ffff (cycle)	0	4byte	RW	Big
24	counter_value_i	0x460	when the GPIO_0 trigger assert, the start of exposure will delay 0-32xffff_ffff (cycle)	0	4byte	RW	Big
25	pwm_source_i	0x470	when the GPIO_1 trigger assert, the start of exposure will delay 0-32xffff_ffff (cycle)	0	4byte	RW	Big
26	IO_link	0x480	when the software trigger assert, the start of exposure will delay 0-32xffff_ffff (cycle)	0	4byte	RW	Big
27	soft_start	0x490	Opt_out output mode: 0-Frame Trigger Wait 1-Exposure Active 2-Strobe 3-User output	0	4byte	RW	Big
28	tri_delay_0_i	0x4a0	GPIO_0 Output mode: 0-Frame Trigger Wait 1-Exposure Active 2-Strobe 3-User output	0	4byte	RW	Big
29	tri_delay_1_i	0x4b0	GPIO_1 output mode: 0-Frame Trigger Wait 1-Exposure Active 2-Strobe 3-User output	0	4byte	RW	Big
30	tri_delay_2_i	0x4c0	Strobe duration time:effective time 0-32xffff_ffff (cycle)	0	4byte	RW	Big
31	tri_delay_s_i	0x4d0	advance the exposure time 0-32xffff_ffff (cycle)	0	4byte	RW	Big
32	output_mode_0_i	0x4e0	later than exposure time 0-32xffff_ffff (cycle)	0	4byte	RW	Big
33	output_mode_1_i	0x4f0	Opt_out--user value	0	4byte	RW	Big
34	output_mode_2_i	0x500	next trigger rising prohibited time 4100~32xffff_ffff (cycle)	4100	4byte	RW	Big
35	duration_time_i	0x510	When counter_reset assert, the counter of trigger will be reseted	0	4byte	W	Big
36	pre_delay_i	0x520	debounce time: 0-20000us	0	4byte	RW	Big
37	output_delay_i	0x530	debounce time: 0-20000us	0	4byte	RW	Big

38	user_value	0x540	debounce time: 0-20000us	0	4byte	RW	Big
39	tri_prohibited_i	0x550	1-enable	3'b111	4byte	RW	Big
40	counter_reset	0x560		1	4byte	RW	Big
41	debounce_0	0x570		0	4byte	RW	Big
42	debounce_1	0x580	MCU 版本+最高帧率+固件版本+固件日期		16byte	R	Big
43	debounce_2	0x590	2bit=0,降噪关; 2bit=1,降噪开	0	4byte	W	Big
44	line_inverter	0x5a0	8,像素位深度为 8bit 8*8Full 10,像素位深度为 10bit 10*8 80bit 12,像素位深度为 12bit 12*4 Medium 16,像素位深度为 16 *1 Base	10	4byte	W	Big
45	output_counter_i	0x5b0	2bit=0, 12bit 2bit=1, 11bit 2bit=2, 11bit 高速率	2	4byte	W	Big
46	pause	0x5c0	该模式只能在 12bit 下 切换 1 为 global reset 模式, 0 为 12bit 模式	0	4byte	W	Big
47	Frame count cleared to zero	0x5d0	该模式只能在 12bit 下 切换 1 为 2-CMS 模式, 0 为 12bit 模式	0	4byte	W	Big
48	Frame count display switch	0x5e0	HDR 计算参数	2359	4byte	W	Big
49	Dark field threshold control	0x5f0	0-16384	2657	4byte	W	Big
50	Version	0x3a0	MCU Version + maximum frame rate + Firmware version + Firmware date	4000	4byte	W	Big
51	Read mode switching	0x1f0	0-2100	100	4byte	RW	Big
52	锐化开关/等级	0x290	0: 锐化关闭 锐化等级: 1-100	0	8byte	W	Big

7.7 SDK & CLView application

7.7.1 SDK

The camera control supports two modes: 1) Controlled through private SDK development kit; 2) Controlled by GenICam interface.

7.7.2 CLView application



Figure 47 Software interface

CLView software can achieve complete control of the camera, and open source to customers to use, while providing technical support.

Description of the main functions of CLView software:

- Serial port control;
- Exposure time control;
- Gain mode control;
- ROI control;
- Frame rate control;
- Trigger mode control;
- Dark field correction control;
- TEC and Fan control;
- Refrigeration temperature control;
- Real-time frame rate display;
- Real-time temperature monitoring;
- Save picture;

Video;

Update online;

Accept customer OEM functions customized.

7.7.3 CLCtrl software

The camera can capture and display images through the software CameraLink capture card, and use the CLCtrl software to control. Start the CLCtrl software first, and then start the acquisition card software after obtaining the control of the serial port.

