

CoaXPress Line scan Cameras

User's Manual



V1 .1.0

Front speech

This File introduces the Install, Function and Config etc. Contents of Product in detail. Please read the Usage Product Front carefully. Read Back Please Save Files properly for Sun Back to check.

Applicable Model

L5087MX470, L5167MX270

Close to this Product

Product Description in this manual is only for sale and Usage in China Large Area. This Product is only eligible for After-sale Service and Maintenance Plan in the Country or Area where it is purchased.

Close in this manual

This manual is only used as a guide to Close Product Note, which may be different from the Actual Product Exists Poor. Please refer to the actual product. Huarui High-Tech may update the XIN version of this manual due to the need of Product Update or Other. If you need the XIN version of this manual, please Login<https://www.irayple.com/cn/home>(The official website of Huarui High-Tech). SuggestionsYour guide in Professional People Down UsageThis manual.

Responsibility Declaration

In the Highest Within Range of the legal Allow, this manual and the Product Bag (including its Hardware, Software and Firmware etc.) are provided "as is". Possible Exists or Errors. No warranty of any kind, express or implied, is provided by Huarui High-Tech, except the warranties of merchantability, Mass satisfaction, or fitness for a particular Destination etc.; Line shall not be liable for any Special, incidental, incidental or consequential damages caused by Usage of this manual or Usage of Huarui High-Tech Product. Bag includes but All losses resulting from Commerce Profit Loss, System Failure, Data, or Files loss.

- Usage This Product Hour, please strictly abide by applicable laws and regulations to avoid infringement of the rights of No.
- Data involved in this manual may cause Bad differences due to Ring environment, etc., and the Company will not be responsible for the resulting Back consequences.
- If the Contents of this manual are in conflict with the applicable laws, the laws shall prevail.

Symbol Convention

In this Files Medium, App ear Down Column Identify may mean Down.

Signal Words	Meaning
 DANGER	Indicates a high potential hazard which, if not avoided, will result in death or serious injury.
 WARNING	Indicates a medium or low potential hazard which, if not avoided, could result in slight or moderate injury.
 CAUTION	Indicates a potential risk which, if not avoided, could result in property damage, data loss, reductions in performance, or unpredictable results.
 TIPS	Provides methods to help you solve a problem or save time.
 NOTE	Provides additional information as a supplement to the text.

Revise Records

Version No.	Revise Contents	Build Date
V1 .1.0	Add Cameras Cameras Install and Software Operation Section Introduction to Interface and LED Light in the Product Overview chapter Add Function Parameters Section Add LSC Calibration Modify Updates the Frame Rate, Trigger Mode, and Gain sections of the Function Parameters section Medium Modify Minute Chapter Order Collecting Mode chapter of DEL Function Parameters Medium	2023.04
V1 .0.0	First time (s) Publication.	2021.07

What to Know about Usage Security

Down face Yes Close to the Correct Alarms Usage Method of Product, to prevent danger, to prevent property from To Loss etc. Contents, Usage Device Front Please read this Note book carefully and follow it strictly at Usage Hour. Please Save the Note book properly when reading Back.

Operation requirements

- Please transport, Usage and Storage Product within Allow's Humidity and Temperature Range.
- Do not drop liquid To or splash liquid To Device Up, and ensure that Device Up does not place Object filled with liquid to prevent liquid from flowing into Device.
- Do not disassemble the Device.
- Only in the rated input Output Within Range Usage Device.

Please Devices Run Front Check Power Supply Power Supply Yes No Correct Alarms.

- Do not unplug the Power Supply Line at the Down Devices side of the Up Battery of the Adaptive.
- When removing the cable Hour, please power off the Device first to avoid injury to the Human.
- Operation Temperature Range : $-20^{\circ}\text{C} \sim +55^{\circ}\text{C}$.
- This is a Class A Product, which may cause Wireless Jamming in the Living Ring Medium. In this case Down, it may be necessary for the User to take practical action on his Jamming.

Install requirements

- People with High Null operation must wear Security cap and Usage Seatbelt, and take Good Protection measures to ensure that they are in Security.
- Do not place the Device and Install in direct sunlight or near the heated Device.
- Do not place Device Install in wet, Yes, dusty, or Smoky locations.
- Please install the Device in the place of Ventilation OK, and do not block the Ventilation

port of the Device.

- Please strictly follow the local XX items have been scanned. Electrical Security Standard to ensure that the Ring Voltage is stable and meets the requirements of Device Power Supply.

- Use the Adaptive or Case Power Supply provided by the Usage Product Manufacturer.

- It is strictly prohibited to Back connect the Power Adapter Up to the devices. Please back connect to the devices Status Down Connect Power Adapter the power is off.

- Please do not provide two kinds of devices with the same Hour and use Up Power Supply. No may cause Devices Bad or Security risk.

- Please Use Power Supply that meets SELV (Security Ultra Low Voltage) requirements. According to the rated Voltage Power Supply of GB8898 (IEC60065) or GB4943.1 (IEC60950-1 conforms to Limited Power Source (Restriction Power Supply)), Specific Power Supply requirements are subject to Devices Tag.

- Please set the Power Output Socket Up of the power grid with protective grounding Yes for the Product Yes To of Class I structure.

- Be sure to connect the Device End to the ground (the copper Line with the Usage Cross Section not less than 2.5mm² must be connected, and the resistance to the ground shall be $\leq 4\Omega$).

- Voltage Stabilizer and Lightning Surge Protector are optional depending on the Power Supply and Week Edge Ring environment on site.

- Product Install Hour needs to ensure sufficient clearance from Thu Week Yes to meet Product's Heat Dissipation requirements, Side not Low at 10 cm, Top not Low at 10 cm.

- The Install of the Product needs to ensure that the Operation Power Supply Plug and Appliance Coupler can be conveniently used to Security Disconnect Product Power Supply.

- The Ventilation hole of the Product shall not Overwrite such as newspapers, tablecloths and curtains, etc. Object to interfere with the Ventilation.

- Product Up Do not place exposed Heat Sources, such as candles lit by Spot.

- The Install of the Product shall ensure that the Product will not be subject to water drops and splashes. Objects filled with liquid, such as vase Mon, shall not be placed on the surface of the Product.

- Product is of Class I structure, and the Power Supply End of Product requires Yes To

and the power grid Output Socket with protective ground Yes.

Maintain requirements

- Unplug the Down Power Supply to ensure that the Product is in Power Supply Disconnected with the power grid.
- Identify alerts Identify near the Close key device in the Maintain Line Channels map Medium.

Directory

Front speech.....	I
What to Know about Usage Security.....	III
No. MonChapter Product Brief Description.....	8
1.1Product Introduction.....	8
1.2Product Highlights.....	8
1.3 Typical Group network.....	9
1.4 Ring Environment Requirements.....	9
1.5 Introduction to Interface.....	10
1.6 Introduction to LED Light.....	10
No. Tue Chapter Camera Install and Software Operation.....	12
2.1Cameras Install.....	12
2.2Collect Card Software Install.....	12
2.3 MVClient Operation.....	13
2.3.1 MVClient Install.....	13
2.3.2 MVClient Operation.....	14
No. Wed Chapter IO Electric Features.....	18
3.1 Cameras Electrical Specification.....	18
3.2 External IOInterface.....	19
3.2.1 Interface Instructions.....	19
3.2.2 Interface Operation.....	19
3.2.3 Pin arrangement.....	20
3.3 External Power Supply Power Supply Requirements.....	21
3.4 Trigger Interface Overview.....	23
3.5 Single End/Bad Minute Config I/O.....	24
3.5.1 Bad Minute Mode.....	24
3.5.2 App ly Example of IOInterface Bad Minute Mode.....	25
3.5.3 Single End Mode.....	27

3.5.4 App ly Example of IO Single End Mode.....	28
3.6 GPIO.....	29
3.6.1 GPIO as input.....	29
3.6.2 GPIO as input Hour App ly Example.....	31
3.6.3 GPIO as Output.....	32
No. Thu Chapter Function Parameters.....	35
4.1 Device Control (Device Settings)	35
4.2 ImageFormatControl (Image Format Management)	37
4.3 AcquisitionControl (Collect Management)	39
4.4 AnalogControl (Analog Control)	41
4.5 LUTControl (Lookup Table Management).....	42
4.6 DigitalIOControl (Number I/O Management)	43
4.7 Frequency Converter Control (Minute time frequency).....	45
4.8 RotaryEncoderControl.....	46
4.9 Transport LayerControl.....	47
4.10 ISPC ontrol (ISPMangement)	48
4.11 TimerControl (Timer Control)	49
4.12 SequencerControl.....	50
4.13 UserSetControl (User Settings Management)	50
4.14 DiagnosisInformation (Diagnosis INFORMATION)	51
附录 1 Legal Statement.....	52
附录 2 Network Security Suggestions.....	53

No. MonChapter Product Brief Description

1.1Product Introduction

CoaXPressLine scan Industrial Camera, featuring High Performance's Photosensitive Chip, The Pass CoaxPressData Interface inputs the Transmission of the Line Image Data, and the Transmission Speed can reach To 4 * 6.25 Gbps or 4 * 12.5G bps. It meets the requirements of most industrial Apply Medium for Transmission Speed, and can stabilize Working in various harsh Ring environments. Yes Mon High Reliability, High Cost Performance Line scan Industrial Camera.

1.2Product Highlights

CoaXPress Interface Line scan Cameras

- Install is simple and Operation is convenient
- Resolution 16K, Line High 120K, theoretical Band width 4 X 6.25G bps
- Yes Software Trigger, Free Run, Collect Card Trigger, etc. Multiple Trigger Mode
- Yes Multiple Image Data Format Output
- Compatible with CoaXPressProtocol and GenICamStandard
- Yes 12 – 24 VDC Width Power Supply
- Comply with CEAuthentication
- Yes Bright Filed Uniformity Correction and Multi-class ispFunction



NOTE

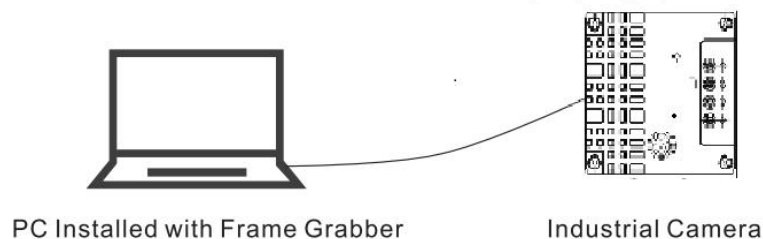
The Minute Function of Cameras depends on the specific Model, and the Actual condition shall prevail.

Close to the specific Parameters of Cameras, please View the corresponding technical specifications.

1.3 Typical Group network

The typical Group network Yes PCInstall CXPTransm ission Interface Collect Card Back of CoaXPressLine industrial Camera scan, Pass CoaXPressLine Cable Collect Card Connect, as shown in Figure 1-1:

Figure 1-1 Group Network Diagram



Connect Good Back , The Collect Card Client of Pass PCInstall or the CTIFile Back of our MV ViewerUsage Collect Card can detect the corresponding Camera, Connect Camera, You can input Line Operation for Camera.

1.4 Ring Environment Requirements

Ring environment requirements for CoaXPressLine scan industrial Cameras such as Down:

- Temperature and Humidity:
 - ✧ Ambient Temperature shall not exceed 50 °C and shall be set as far as possible in the Ring of Yes Null and Down Working:
 - ✧ Working Hour Ring Humidity: 20% ~ 80% non-condensing.
 - ✧ Storage Temperature : -30°C ~ +80°C 。
 - ✧ Storage Humidity: 20% ~ 80% non-condensing.
 - Devices Install is Indoor, Location is stable, and the Front Back Left Right remains Yes enough Heat Dissipation Null.
 - Null gas flow for Mon is guaranteed.
-



NOTE

The Minute Function of Cameras depends on the specific Model, and the Actual condition shall prevail.

Close to the specific Parameters of Cameras, please View the corresponding technical specifications.

1.5 Introduction to Interface

Table 1-1 Introduction to Interface

Interface Name	Interface Instructions
CXPInterface	Used for Streaming Data and Control Data Transmission. The CXP-6 Interface Cameras use DINInterface and the CXP-12 Interface Cameras use Micro-BNC Interface.
Power Supply and IOInterface	24V Power Supply and IOFunction are provided, and the Connector is 12PIN. Close For pin definition, please View No. Thu for IO definition Note

1.6 Introduction to LED Light

Minute: Yes 4 Channels LED Light and 1 Power Supply Indicator are used for Display Camera Status, as shown in Figure 1-2. Refer to Table 1-2 for specific Indicator corresponding Status

Figure 1-2 Introduction to Interface

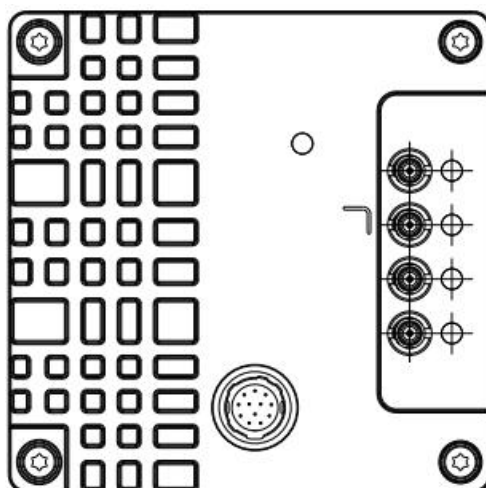


Table 1-2 Indicator Status Table

Status	Description
Power Supply Indicator and Channels Indicator Unlit.	Cameras Not Up Power
Power Supply Indicator Red Light Flicker , CH1-CH4Red Light Always On	Up Electric Start
Power Supply Indicator Blue Light Always On, CH1 Red Green Quick Flash	Cameras Initialization Complete , Wait Yes
Channels Indicator Green Light Red Light Alternate Slow Flash	Camera Update Medium
Channels Indicator Red Light Always On	Cameras Malfunction .
CH1Red Light Flicker	Cameras Initialization Complete , Wait Collect Card Yes
Channels Indicator Green Light Always On	Camera Connection succeeded., No data available. Transmission, or Data Transmission Abnormal.
Channels Indicator Red Light Slow Flash	Cameras Trigger Mode , No data available. Transmission .
Channels Indicator Green Light Quick Flash	Cameras stream Status Medium.



NOTE

Minute Camera Model Indicator Status differs from Yes Bad in Table Up. Actual Devices shall prevail.

No. Tue Chapter Camera Install and Software Operation

2.1Cameras Install

- 1.Fix the Cameras To Install Location and Select the appropriate Lens Install To Cameras Up.
2. Usage CoaXPress Cable Yes Cameras and CoaXPress Image Collect Card.



NOTE

- Please select Correct Alarms CoaXPress Cable into Line Connect, Please input Line Select according to Cable Protocol, Port Type and Implementation Method for specific Usage.
- Camera Yes 2 Cards or 4 Cards CoaXPress Interface, Pass 1, 2 or 4 Cards CoaXPress Interface Transm ission Data. The Usage Interface Quantity is different, which can be identified by the Data Bandwidth Yes of Transmission.
- Camera Model is different, Screen Printing Yes of Camera Interface is different, and Quantity Yes of Camera Interface is also different. Main requires Minute to be CH1 ~ CH4 and CH1 ~ CH2, and Minute to be Yes 4 Cards and 2 Cards Interface.
- Connect the 6-pin or 12-pin Power Supply I/O Cable to the appropriate 24V Power Supply Adapter Up, Close to the Select requirement of the Power Supply Adapter. For details, please refer to corresponding technical specifications of View.

2.2Collect Card Software Install

1. Camera requires Pass Collect Card Software Setting Camera Parameters and View Camera Image.
2. Install Collect Card Software Back, The Collect Card Yes No corresponding to the Interface Medium View of the Device Settings of the PC can be PCCorrect Alarms Recognize.



NOTE

- Collect Card driver does not Install or Install does not Correct Alarms, MV or Collect Card Client will not Enumeration To Camera.
 - A Minute Collect Card driver needs to install another driver Collect Card Software Back the Install is finished. The details are subject to the Collect Card of Usage.
 - Please View Collect Card Manufacturer the corresponding information or contact the Collect Card Manufacturer Yes People for the specific Usage and Install of Collect Card.
 - **Recommend Usage Our self-developed Collect Card. How to Install and Usage our**
-

self-developed Collect Card? Please View the corresponding information or contact our technical Yes.

2.3 MVClient Operation

Pass MV Client or Collect Card Software Connect Camera and input Line General Settings, Image Collect etc. Operation. The MV Client CLVersion Yes is connected to CoaXPressCamera.



NOTE

- A Minute Collect Card Manufacturer No GenTL Protocol or no CTI File is provided, If you need to input Line General Settings, Image Collect etc. Operation, you can input Line with Pass and Close Manufacturer Collect Card Software.
- Camera Parameters can input Line Read/Write in Medium Mon Cards program of Usage MV Client or Collect Card Software. However, it cannot be described with Hour Usage Up Cards Software Read/Write.

2.3.1 MVClient Install

MV Client Yes Install on Windows 10 32/64bit null Up.

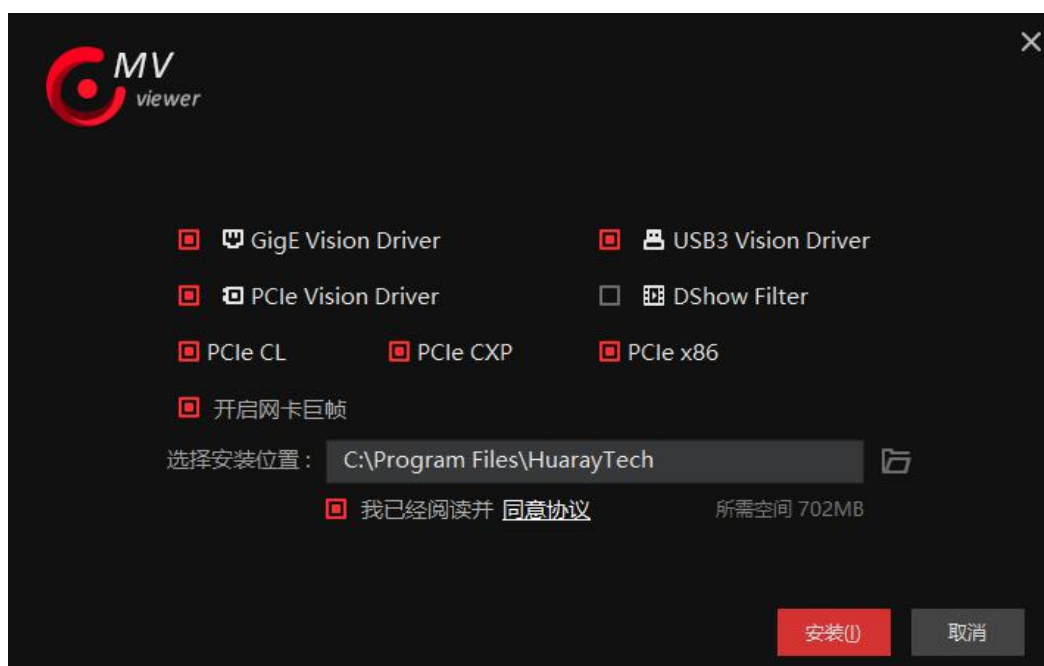
The specific Operation Step is Down:

Please "Service Yes > Download Medium > Software" Medium Download MV Client CXPVersion "on the official website of Sub Huarui High-Tech (www.irayple.com). Install Bag .

Please Close Firewall and Security Software for Front of Install MV Client.

Double-click Install Bag, click "Install", and the Install Hour Default Install driver is shown in Figure 2-1.

Figure 2-1 Install Options

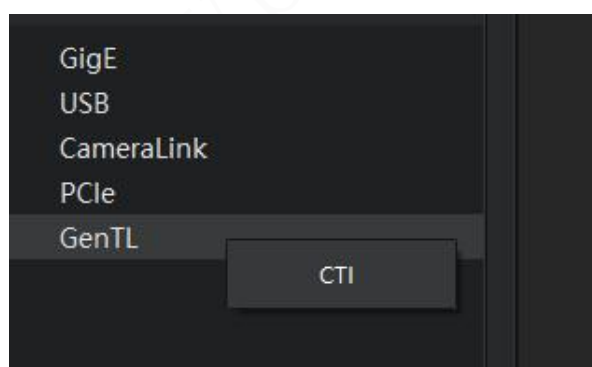


2.3.2 MVClient Operation

Spot Click the desktop MV CREATOR Method, Open Client.

Spot Click the GenTL of the MV Device List Medium, click the Select CTIFile "with the Mouse Right key, and click the Collect Card CTIFile corresponding to Medium Select in the Open window. As shown in Figure 2-2;

Figure 2-2 Select CTIFile

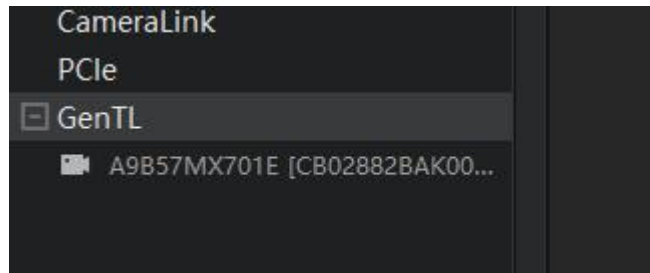


NOTE

Different Camera Collect Card have different ctiFiles. Please input Line Select in the corresponding Client Install Path.

Selected CTIFile Back, the MV Client will Auto Enumeration Cameras, as shown in Figure 2-3.

Figure 2-3 Enumeration Cameras



Search To Camera Back. Double-click Connect Camera. The Client is shown in Figure 2-4. Refer to Table 2-1 for the Partition Functions of Client Main Interface.

Figure 2-4 MV Main Interface

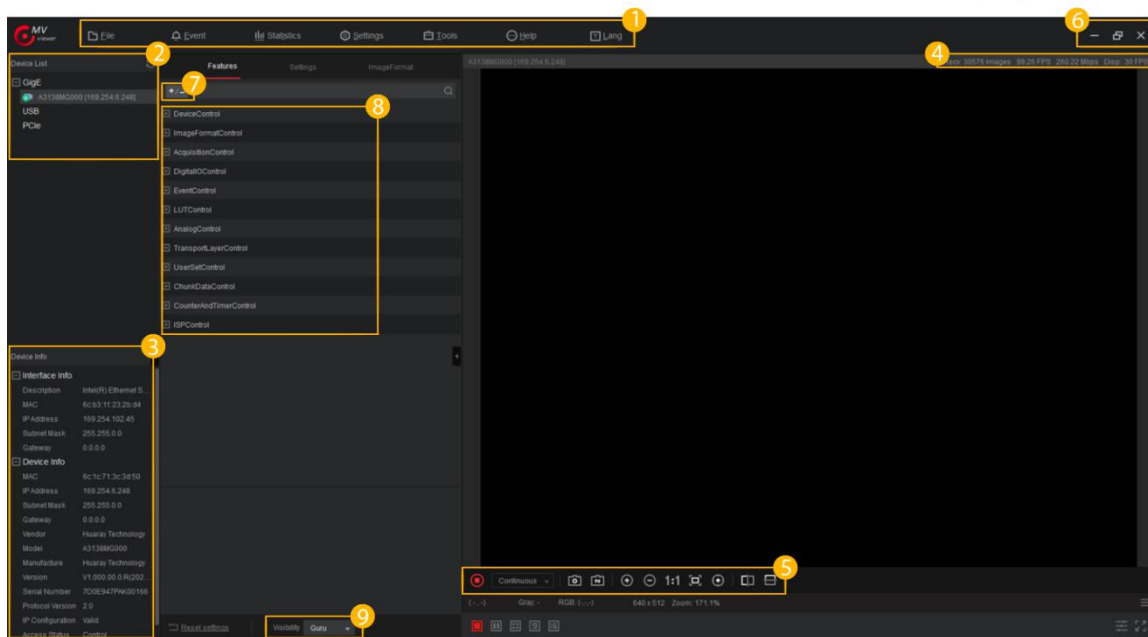


Table 2-1 Introduction of Each Region Function

No.	Parameter	Description
1	Menu	See Table 2-2 for details.
2	Device list	Includes GigE, USB, CameraLink ,CXPand PCIe cameras.
		 : Click the icon to manually refresh the online device information.
		 : Device to be connected.
		 : Device is connected. MV Viewer can only connect and operate on one camera at a time.
3	Device information	Interface and device information of the selected device.
4	Image configuration	Includes video stream, image stream, display stream, image position, gray level and RGB value.

No.	Parameter	Description
5	Tool bar	 Continuous /  : Play/stop playing. Click  and select play mode among continuous, single frame and multiple frames as needed.  You can only select play mode when the video is paused.
		  : Save single or multiple frames of images.
		  : Zoom in or out the image.
		  : Displays the image in 1:1 ratio or as the window size.  When the image is zoomed in or out, click  can restore the image to windows size.
		  : The mirror of image in the vertical or horizontal direction.
6	Window operation menu	   : Maximize/restore/minimize the image window.  : Close MV Viewer.
7	Parameter information	  : Display or hide all function parameter information.
8	Function parameters	Select and configure specific function parameters. See Table 2-3 for details.
9	Operation level	Click  to select characters among Beginner , Expert or Guru from the drop-down list as needed. Each character corresponds to slightly different sets of parameters.

In the camera Attribute Tree Medium, click "+/-" on the Attribute Front side to show the Front Attribute Large class as Show Less or Show More. See Table 2-2 for the introduction of each Attribute Category.

Table 2-2 Introduction to Camera Properties

Attribute	Name	Function Description
Device Control	Device Control	For View Device Info, Edit Device Name, and Restart
Image Format Control	Image Format Control	Resolution, Mirror Function, Pixel Format, ROI Region, and Test Image etc. For View and SETTING Camera.
Acquisition Control	Collect Control	Collect Mode, Frame Rate, Trigger Mode, Exposure Time etc. For View and Setting Camera.
Analog Control	Analog Control	Analog signal for View and Setting Camera, including Gain, WB and HEI Level etc.

Attribute	Name	Function Description
Digital IO Control	Number I/O Control	Different I/O signals for Settings
Transport Layer Control	Transmission Layer Control	This Attribute is used to set the Close Parameters, Camera link number and Transmission Speed Setting for the Transmission Protocol of Camera.
ISP Control	ISPC ontrol	Image Module Bag for Setting Camera include: FFC, LSC, and Brightness etc.
User Set Control	User Parameters Control	Used to Save, load Cameras' Parameters, or Settings Default Start's Parameters
Diagnosis Information	Diagnosis INFORMATION	Used to count the trigger signal Quantity of Cameras receiving To, the trigger signal Quantity of Discarding, and the plot Quantity etc.

This can be done at Transport Layer Control Attribute Medium Setting Camera link Quantity, per Cards link Transmission Speed. See Figure 2-5

Figure 2-5 Cameras LinkConfig

NumberOfLink	Cxp_2links
LinkSpeed	Cxp_6Gbps
DefaultNumberOfLink	Cxp_2links
DefaultLinkSpeed	Cxp_6Gbps

No. Wed Chapter IO Electric Features

This chapter describes the Electrical Hardware Specification of Line scan Industrial Camera, including Camera Interface Electrical Parameters, Line Method and Error Troubleshooting.



NOTE

Power Supply Power Supply must meet the SELV and LPS Specifications.

Usage must conform to the 75 Ω Coaxial of the CoaXPress Protocol Standard.

3.1 Cameras Electrical Specification

CXP6 Interface Down Exists Electrical Specification: 12PIN.

Table 3-1 CXP-6 Interface Line scan Cameras 12PINHardware Phase Close
Electrical Specification:

Module	Instructions
Data Interface	CoaXPress1/2/4Channels Yes 2.5/3.125/5/6.25G bpsSpeed
Sync Method	Hardware external trigger, Software trigger, free Run
Exposure Control	Hardware external triggering, Pass Cameras APIPro gramming settings
Cameras Power Supply Specification	+ 9 ~ + 24VDC/1A, < 1% ripple, Pass Cameras 12-core HiroseYes Power Supply 1; PoCXPPower Supply 2;
I/O Interface	4 Channels Non quarantine RS-422Bad Minute input \ Output (or 4 Channels Single End Non quarantine input \ Output) 1; 1 Channels non-isolation order End can Config input \ Output
Weight	TBD
Lens Interface	Optional M58, Adapter Ring for F port
Authentication	CE/FCC/RoHS



NOTE

1. Single End \ Bad Minute, input \ Output Function Pass Software Config CHG.

External Power Supply must meet SELV and LPS Specification

3.2 External IOInterface

3.2.1 Interface Instructions

Figure 3-1 CXP-6 Interface Instructions

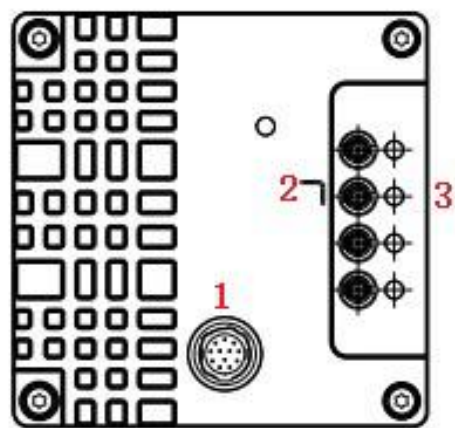


Table 3-2 CXP-6 Interface Instructions

null	Instructions
1	12-cell Hirose Socket
2	CXP-6 Interface （4 Group ）
3	Status Indicator

NOTE

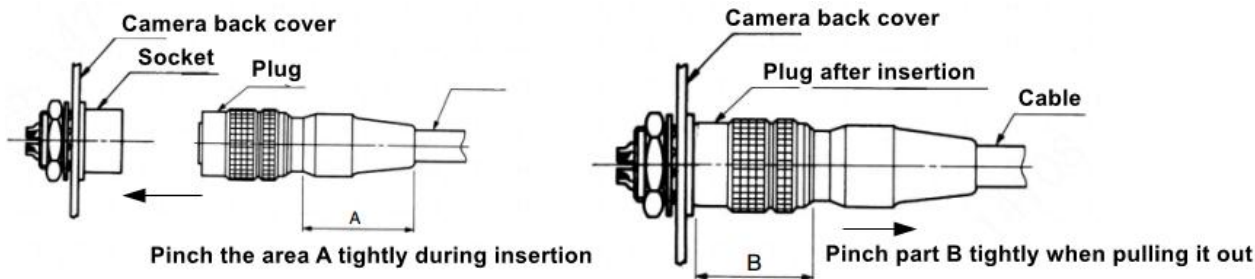
The 12-core Interface is connected to the Plug-in HR10A-10R-12 PB (71), which is the same as the etc. Product. The Cable End is the same as the etc. Product of the Usage HR10A-10P-12S (73). A Cable Connector whose Usage is not Adaptive may cause Camera Interface Bad.

3.2.2 Interface Operation

Step 1 Align the guide groove of the Plug-in at the front of insertion, then Back pinch the Back End Black Rubber part (A) of the plug, and push it in with vertical force. Listen to the To click Back Note insert To The new password must contain at least% 1 characters.

Step 2 If you need to pull out the Cable, pinch the metal part (B) of the Front End of the plug and pull it out with vertical force.

Figure 4-3 Interface Operation



Step 3 Before plugging in or disconnecting the 12-core Power Supply and I/O to the Plug-in Front, please Close Power Supply first to avoid live plugging and unplugging.



NOTE

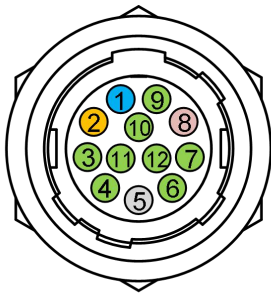
Product must be the Power Supply Line component of the Usage recommended by the Usage Local District, and the Usage must be within its rated Specification!

Please be sure to Usage Device Included the Power Adapter. The User shall be responsible for the People injury or Device damage caused by No.

Please Use a Power Supply that meets SELV (Security Ultra Low Voltage) requirements. And meet the rated Voltage Power Supply of Limited Power Source (Restriction Power Supply) according to IEC60950-1, and the specific Power Supply requirements shall be subject to Devices Tag.

3.2.3 Pin arrangement

Figure 4-5 Pin layout of 12-pin Power Supply/Trigger Interface:



- =Signal Ground
- =Power Ground
- =Power

- =Differential Input/Output
- =GPIO

Table 4-5 12-pin Power Supply/Trigger Interface Signal Definition:

Color	Pin	Signal	Input/output	Specifications
-------	-----	--------	--------------	----------------

				Differential mode	Single-ended mode
	1	GND	-	Power GND	
	2	VIN	-	Camera Power Supply	
	3	LINE1+	Input/output	Configurable Input/output	Configurable Input/output
	4	LINE1-	Input/output	Configurable Input/output	Suspended (not connected)
	5	GND	-	Signal GND	
	6	LINE2+	Input/output	Configurable Input/output	Configurable Input/output
	7	LINE2-	Input/output	Configurable Input/output	Suspended (not connected)
	8	GPIO (LINE5)	Input/output	non-isolated configurable I/O	
	9	LINE3+	Input/output	Configurable Input/output	Configurable Input/output
	10	LINE3-	Input/output	Configurable Input/output	Suspended (not connected)
	11	LINE4+	Input/output	Configurable Input/output	Configurable Input/output
	12	LINE4-	Input/output	Configurable Input/output	Suspended (not connected)
	Shell	Shield GND	Shell	Connected to the encoder shield	



The color coding given in the table is the definition of the I/O cables of iRAYPLE cameras.

3.3 External Power Supply Power Supply Requirements

1. The Product must be a Power Supply Line component recommended by the Usage Local District, and the Usage must be within its rated Specification.
2. Please be sure to Usage Device Included the Power Adapter. The User shall be responsible for the People injury or Device damage caused by No.
3. Please Use the Power Supply meeting the requirements of SELV and PELV, and the specific Power Supply requirements shall be subject to Device Tag.



WARNING

inputing Line Install or connecting Line to Camera and other Devices under live condition Down may cause electric shock or Devices Bad. Please follow the appropriate Security Protection specifications. And Power Supply Disconnected of OK Camera.

For a specific App ly, the optimal grounding Plan should be Yes to ensure that all Yes locations of the Camera and other Close Devices are grounded at a single Spot. The Cards alone should Connect directly to the Location in the System Up. In order to improve the anti-Electron Noise capability of High, Recommended connects the Total Spot Connect To of Yes DC Power with the Location Up of Mon Cards Single. Similarly, the Recommended connects the male Total Spot (M) of the Sensor Power Supply to ground.

The grounding Line of Yes should be as short as possible and the Line diameter of Usage should be thicker (not Less than 2mm² or 14AWG).

When the Select is connected to the Location Hour, consideration should be given to Security grounding requirements and proper protection of Isolator components.

During Line Hour, avoid connecting trigger signal Line, Communication cable and AC Line or DC Line of High Energy Fast Enable (such as Relay, The driving Line (Design) of the AC Contactor Line circle is in the Medium of the Line slot with Mon Cards. Usage Shield cable can get the best anti-Electron Noise Features of To. Usually, Connect the Shield layer with the shell of the trigger Interface to get the best effect of To.

When the input electrical Route Mon Cards external Power Supply Power Supply Hour, protect the device at the electrical Channels Medium Add Overcurrent (for example, Fuse).

In the Down Usage Camera Hour of the Scenario (e.g. Motor Driver, Frequency Converter) of the potential Strong Jamming Source, Recommended provides independent Source Power Supply for Camera and its Connect Sensor to avoid Jamming Noise caused by Source Line Upload.



CAUTION

If it is not a Special Note, the Metal Housing of the external trigger Interface, the Signal Ground of the trigger Interface, and the Yes between the Power Ground and the Camera Metal Baffle are not Insulation. Please do not make the potential between the internal public Total and the end child Poor due to the potential between the positive grounding Ring or the device Poor. No will cause the Connect computer etc. Peripheral Device or Controller Error.

The Low voltage Channel's connected to the Camera by Yes, such as the Sensor Power Supply Power Supply, must quarantine with the AC Line and other High voltages. Complies with various Security Standards.



DANGER

Usage in Alternating Current (AC) Channels does not quarantine or single quarantine Power Supply to Devices Power Supply. It will not generate Security Voltage in Security Channels (such as Sensor Channels and Communication Channels) Medium.

This High Voltage will cause death or Critical People's health damage and Devices Bad.

Only the converters with Yes Usage High Voltage To Low Voltage can guarantee Channels Security.

3.4 Trigger Interface Overview

The line scan camera is powered and provides trigger input/output through a 12-pin Hirose interface.

External trigger interface supports the following voltage level standards:

Table 2 Trigger interface support level standard overview

Category	Level Standard	Direction	Description
Single-ended Pattern	TTL	Input	Standard TTL level input
	TTL	Output	Standard LVTTTL level output
	NPN	Output	NPN (emitter/open-collector) Output
	Single-ended voltage	Input	PNP, complementary output sensor (direct connection) NPN Output Sensor (with external pull-up resistor)
Differential Pattern	RS422	Input	Built-in optional 100Ω terminating resistor
	RS422	Output	Built-in optional 100Ω terminating resistor
GPIO	TTL	Input	Standard TTL Level input
	NPN	Input	NPN output sensor (direct connection)
	NPN	Output	The built-in resistor is pulled up to 3.3V. Pulled up to the target level by an external resistor.

LINE1~LINE4 in the 12-Pin interface can be configured as single-ended/differential IO. When operating in differential mode, it can be connected as a differential output encoder, providing differential signals labeled RS422 level to PLC, motion control cards, or triggering other cameras in cascade. When operating in single-ended mode, it can be connected as an input to various types of single-ended output encoders or PLCs, and as an output to a light source controller.

LINE5 is a bidirectional input/output that can be programmed to configure GPIO. When used as input, it can be connected to a Sensor with NPN output. When used as output, it is equivalent to NPN output.

3.5 Single End/Bad Minute Config I/O

LINE1~LINE4 are single-ended/differential configurable IOs, and the internal electrical circuit of their interface is as follows:

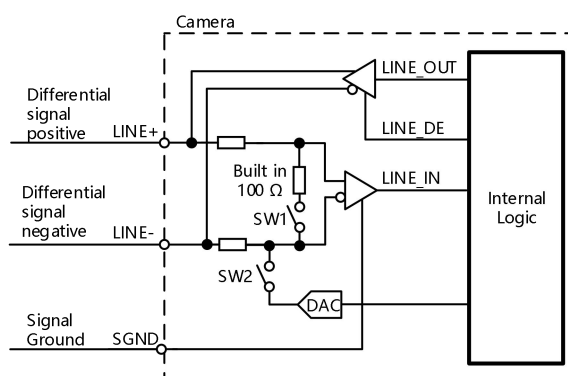


Figure 3 Internal electrical circuit of the single-ended/differential configurable IO interface.

Single-ended/differential configurable IO interface has the following characteristics:

- Non-isolated RS422 differential branch transceiver;
- input the range of common mode voltage, which is $\pm 24V$.
- The static protection capability of 15kV HBM.
- Support for Pulse Input/Output (I/O) with a minimum width of 50ns.
- Supports up to 10MHz Pulse Input/Output (I/O).
- Built-in Software configurable 100Ω termination resistor;
- Ensure a 'high' input state (Bus Fail-Safe function) when not connected externally.
- Built-in high-frequency noise filtering electrical circuit.
- Having a software-configurable comparison level threshold (used for single-ended entry);

There are two operating modes for the IO interface: differential mode and single-ended mode. The four IO ports (LINE1~LINE4) can be configured into different operating modes.

3.5.1 Bad Minute Mode

The Bad Minute input Mode Down input Level and input Status are shown in the Down table:

Table 3 Differential interface input voltage and logic state

Input Voltage	input status
---------------	--------------

$(V_{LINE+}-V_{LINE-}) > V_{threshold}$	High (Logic 1)
$(V_{LINE+}-V_{LINE-}) < -V_{threshold}$	Low (logic 0)
input Not Connected	High (Logic 1)



NOTE

The built-in threshold level $V_{threshold}$ of the RS422 transceiver is 200mV.

The relationship between the output level and the load resistance in differential output mode is as follows:

Table 4 The relationship between the differential output voltage and the load resistance

Output Voltage	Load resistor	Voltage (V)	
		Minimum value	Maximum value
$V_{OD}=V_{LINE+} - V_{LINE-}$	$R = \infty$ (no load resistance)	1.5	3.3
	$R = 27\Omega$ (equivalent to 4 cameras)	1.5	3.3
	$R = 50\Omega$ (equivalent to 2 cameras)	2	3.3



NOTE

High-speed differential interface uses signal ground as the common mode voltage reference ground. Please connect the power ground of the differential encoding output to this pin.



CAUTION

When the camera is operating in differential mode, do not connect single-ended signals to the differential input interface, as this will corrupt the internal 100 Ω termination resistor.

3.5.2 App ly Example of IOInterface Bad Minute Mode.

(1) The IO interface connects differential encoder as an input.

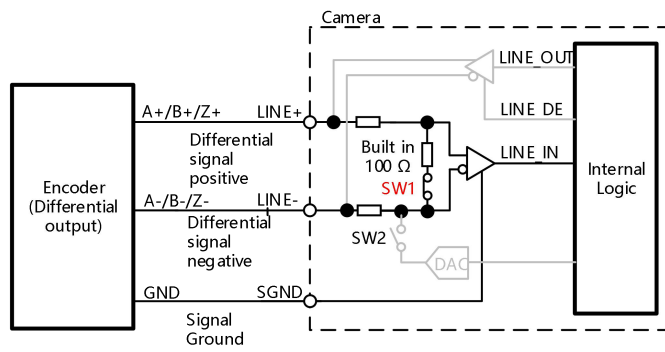


Figure 4 IO interface connects differential encoder as a input

(2)The IO interface triggers another camera as an output.

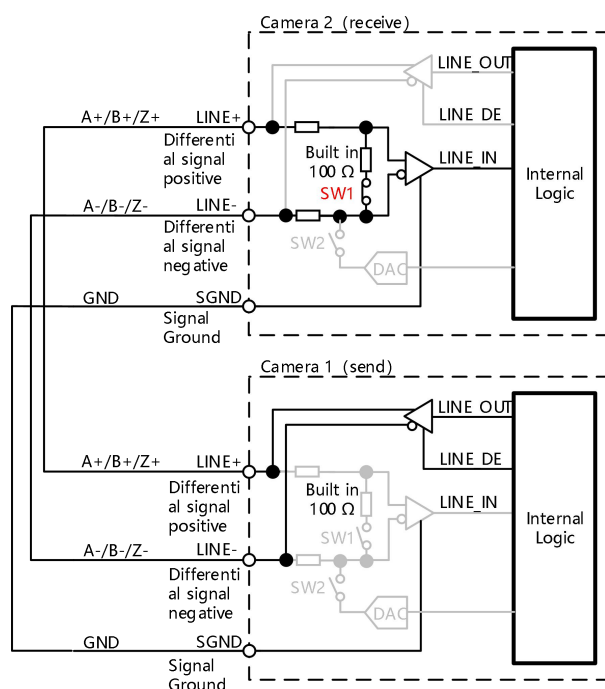


Figure 5 IO interface triggers another camera as an output

3.5.3 Single-Endde Mode

When the IO port works in single-ended input mode, the LINE-pin is suspended (not connected), and a threshold level with adjustable amplitude is generated inside the camera and sent to the LINE-pin. The RS422 receiver compares it with the external device of LINE+ to realize the high and low level judgment of the external device. In order not to affect the input function, the RS422 transmitter part and the built-in 100Ω termination resistor are automatically disconnected at this time.

Different input voltage standards can be set by selecting different input level standards in the camera software. The range of comparison threshold values is 0~10V, and the corresponding relationship with the camera's property value is shown in the table below:

Table 5 Relationship between input level standard and threshold voltage

Input level standard	Threshold voltage
LVTTL(3.3V)	1.5V
TTL (5V)	2.5V
12V	6V
24V	10V

NOTE

In order to suppress external noise, the RS422 receiver is equipped with a built-in hysteresis threshold of +/-200mV. This means that when the input voltage LINE+ exceeds the threshold

voltage by 200mV, it is considered as a high level; when the input voltage LINE- is lower than the threshold voltage by 200mV, it is considered as a low level.



CAUTION

When the camera operates in single-ended mode, the reference ground for the input signal is signal ground (pin 5). The LINE pin must be left floating.

3.5.4 Apply Example of IO Single-Ended Mode

(1) The IO interface connects single-ended encoder as an input.

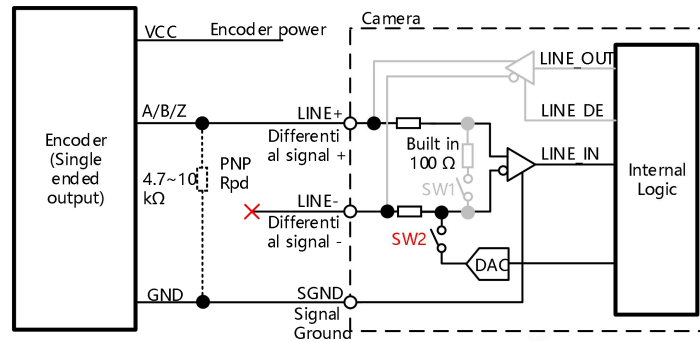


Figure 6 IO interface connects single-ended encoder as an input



NOTE

When connecting a PNP output encoder, you need to connect an external pull-down resistor to GND. The resistance value should be between 4.7K and 10kΩ. For details, refer to the encoder electrical specification.

(2) The IO interface connects light source controller as an output.

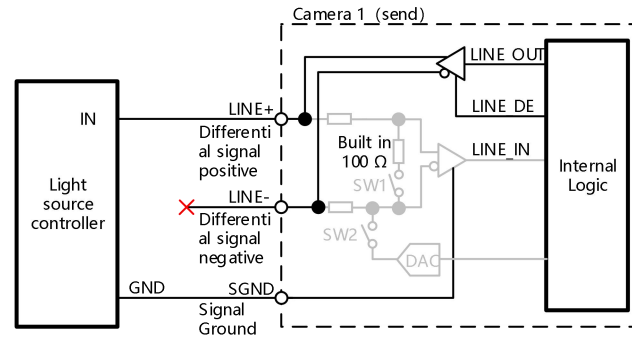


Figure 7 IO interface connects light source controller as an output



NOTE

When used as single-ended output, the IO port can be configured to LVTTTL or NPN output through software, and the wiring method is the same.

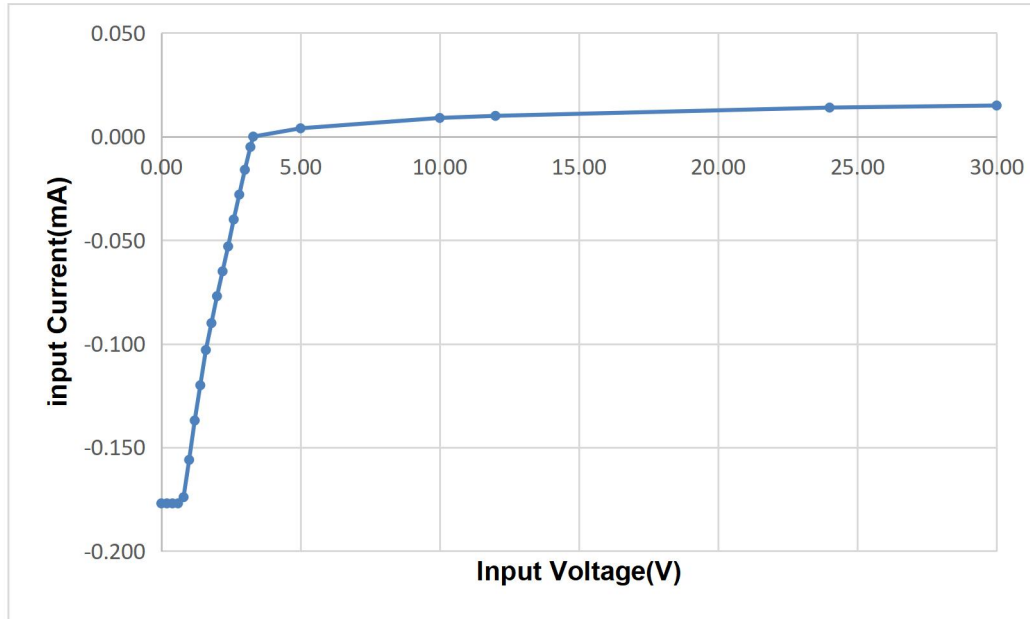
3.6 GPIO

3.6.1 GPIO as Input

Voltage	Description
+26VDC	Limit voltage, input cannot exceed this limit, otherwise it will cause device corrupt.
+0~+24VDC	The input safe operating voltage range (minimum voltage of 3.3VDC when externally pulled up).
+0~+0.8VDC	Logic 0
>+0.8~+2.2VDC	The input state is flipped here, and the logic state is uncertain within this voltage range.
>2.2VDC	Logic 1

When GPIO is used as input, the relationship between the injected (sink) current and the external input voltage is as follows.

Table 6 The relationship between GPIO input current and input voltage



NOTE

1. may be individual differences between different cameras.
2. The maximum leakage current of GPIO input is 15 μ A (measured at an external input voltage of 30V).

The relationship between the GPIO input signal amplitude and trigger delay is shown in Table 7.

Table 7 Relationship between GPIO input signal amplitude and trigger delay

Input signal amplitude (Vp-p)	Rising edge trigger delay t_{DR} (us)	Falling edge trigger delay t_{DF} (us)
3.00	6.783	0.339
5.00	6.563	0.200
9.00	6.164	0.106
10.00	6.416	0.960



NOTE

1. Trigger delay measures the time delay from the external GPIO port to the FPGA input pin, without considering the internal logic latency of the FPGA.
2. The shortest positive pulse supported by GPIO input is approximately 20 μ s (typical value), and the shortest negative pulse is approximately 2 μ s (typical value).
3. The latency of GPIO interface is lower than that of optocoupler isolation interface.

3.6.2 Apply Example for GPIO as Input

(1) GPIO as input to connect mechanical switch:

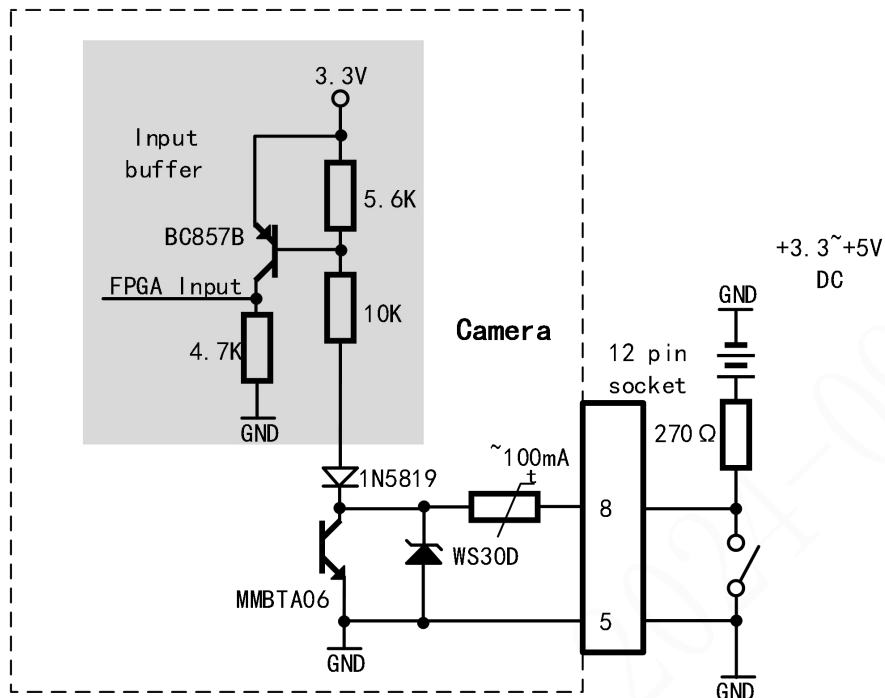


Figure 8 GPIO as input to connect mechanical switch

(2) GPIO as input to connect 5V TTL logic output:

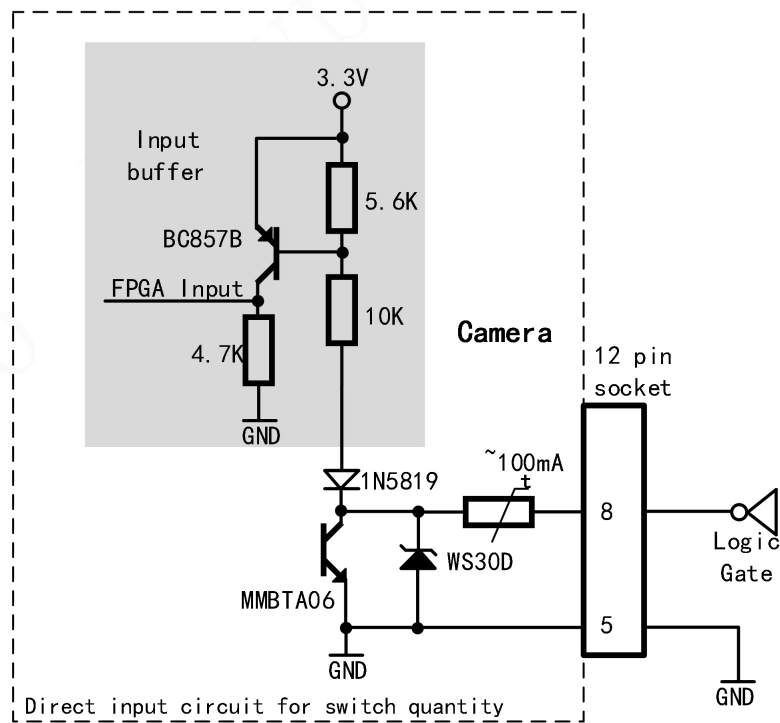


Figure 9 GPIO as input to connect 5V TTL logic output

3.6.3 GPIO as Output

Voltage	Description
+30VDC	Limit voltage, output cannot exceed this limit, otherwise it will cause device corrupt.
+3.3~+24VDC	The output safe operating voltage range.
<3.3VDC	I/O output may encounter errors.

As an output, the GPIO port can provide a maximum current of 50mA.

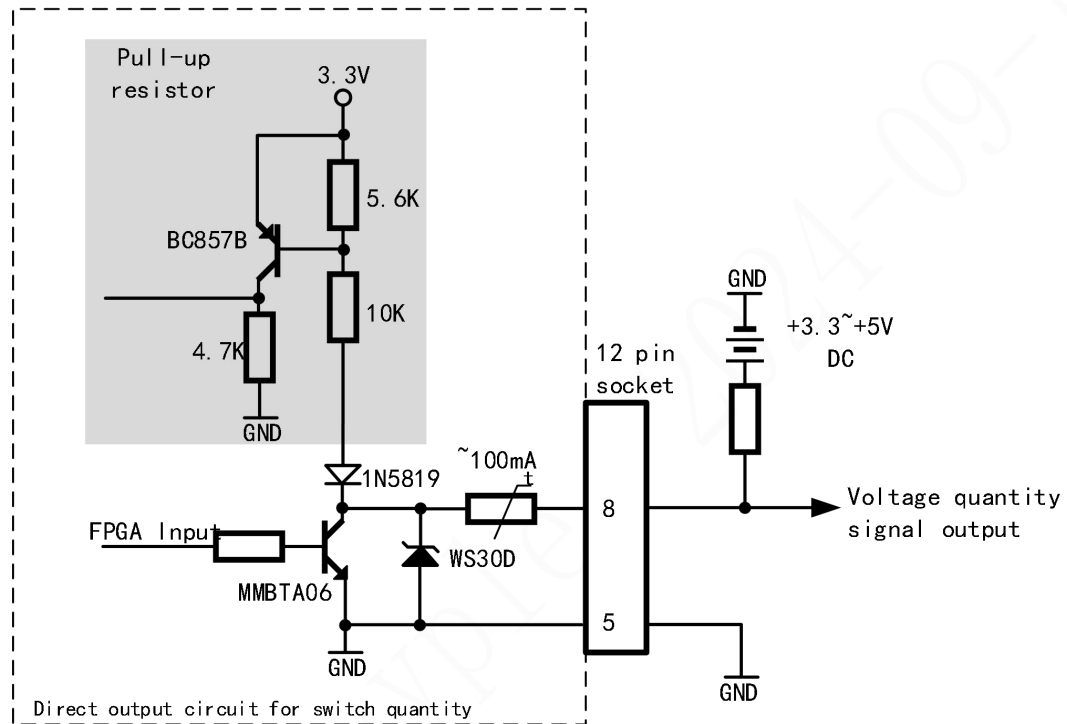
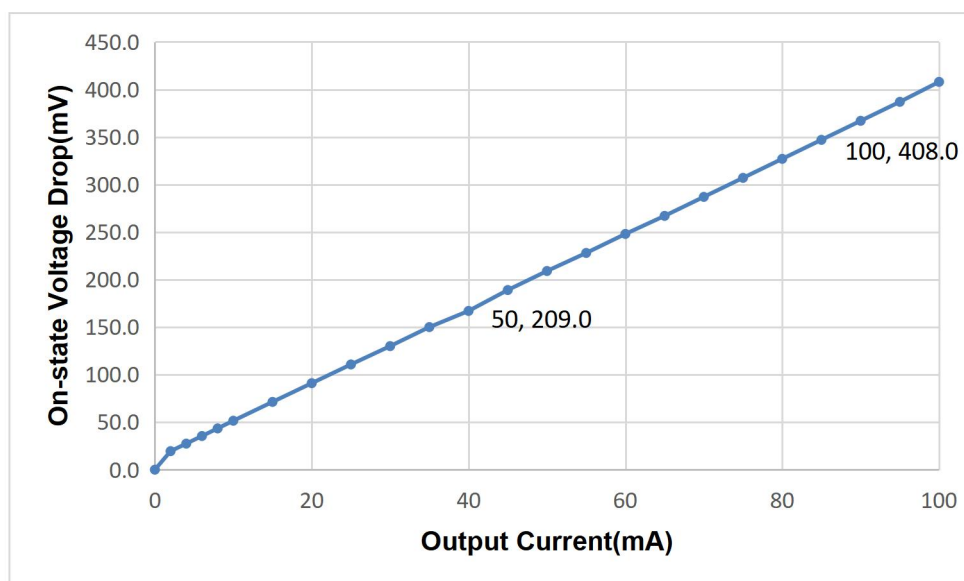


Figure 10 Diagram of the internal electrical circuit when GPIO is used as output

The relationship between GPIO output on-state voltage drop (voltage drop between GPIO and GND) and output current (current flowing into the GPIO pin) is as follows

Table 8 Relationship between GPIO output on-state voltage drop and output current



NOTE

1. The above values are typical values measured at an ambient temperature of 25°C, and there may be individual differences between different cameras.
2. When GPIO is used as an output, the maximum voltage drop is 0.41V (with an output current of 100mA).

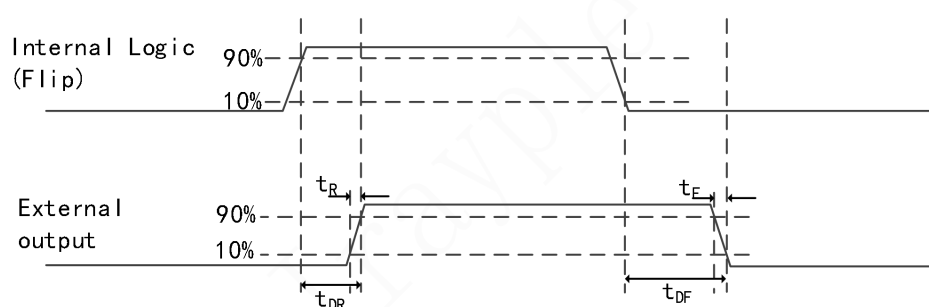


Figure 11 GPIO output signal latency circuit

When using a 470Ω pull-up resistor, the rise/fall time of the output and the rise/falling edge latency time at different external power supply voltages are shown in Table 9.

Table 9 The relationship between GPIO output voltage and latency time

External power supply voltage (V)	Rise time t_R (us)	Descent time t_F (us)	Rising edge trigger delay t_{DR} (us)	Falling edge trigger delay t_{DF} (ns)
None	-	-	5.43	0.35
5	0.16	0.02	1.80	39
12	0.22	0.04	2.37	71



NOTE

1. Output latency measures the delay from the FPGA pin output to the GPIO pin, without considering the internal logic latency of the FPGA.
2. When there is no external pull-up resistor, the shortest output positive pulse is 11µs, and the shortest output negative pulse is 1µs.
3. The latency of the GPIO interface is less than that of the optocoupler isolated interface.

401216 Trayple 2024-09-14

No. Thu Chapter Function Parameters

In this chapter Main, the Function Parameters that are Close to Industrial Cameras will be explained.



NOTE

- Industrial Camera Yes Beginner (Beginner), Expert (Expert) and Guru (Guru) are User level Select. The Parameters XX items have been scanned. Of the corresponding Attribute window Medium are slightly different for each Cards level.
- The Parameters XX items have been scanned. Of Black Display indicates that the Parameters can be Modify or Setting. The Parameters XX items have been scanned. Of the Gray Display indicates the Current Status Run Mode Down of the Parameters No Modify or Setting.
- Software Interface may be different from Yes in the introduction of Parameters in this manual due to Up grade. Please refer to Actual.
- The Attribute Yes of Camera of different Models is different. The specific Attribute Parameters can be found in the Attribute column Medium View of Client MV.

4.1 Device Control (Device Settings)

DeviceControl	
DeviceVendorName	Machine Vision
DeviceModelName	L5167MX270
DeviceManufacturerInfo	Machine Vision
DeviceVersion	V2.000.00.0.M(20240905,3284...
DeviceFirmwareVersion	V2.000.00.0.M(20240905,3284...
DeviceSerialNumber	667788990
DeviceUserID	
DeviceScanType	Linescan
DeviceTemperatureSel...	Sensor
DeviceTemperature	43.50060 C
DeviceReset	{Command}
LedMode	On

Parameters	Instructions
DeviceVendorName	Device supplier.
DeviceModeName	Device Model .
DeviceManufacturerInfo	Manufacturer .
DeviceVersion	Devices Software Version with brackets Medium Include Date and SVN number.
DeviceFirmwareVersion	Devices Firmware Version, bracket Medium Include Date and SVN number, Minute number The Number on the Back side stands for Hardware Version.
DeviceSerialNumber	Device SN .
DeviceUserID	User Customize Device Name .
DeviceScanType	Device Type: Line scan.
DeviceTemperatureSelector	Select View Sensor Board also Yes Mainboard Temperature.
DeviceTemperature	Sensor plate or Mainboard Actual Temperature No. (°C).
DeviceReset	Device Restart .
LedMode	Channels Indicator On/Off . Default is on

4.2 ImageFormatControl (Image Format Management)

ImageFormatControl	
SensorWidth	16,384
SensorHeight	2
WidthMax	16,384
Width	16,384
Height	2,048
OffsetX	0
MultipleROIEnable	False
MultipleROICount	{Not Available}
MultipleROISelector	{Not Available}
MultipleROIOffsetX	{Not Available}
MultipleROIWidth	{Not Available}
Binning	Off
BinningMode	Avg
ReverseX	False
PixelFormat	Mono8
PixelSize	Bpp8
PixelColorFilter	None
PixelDynamicRangeMin	0
PixelDynamicRangeMax	255
TestImageSelector	Off
SensorColorType	Mono
TallPixelMode	False
TdiMode	SingleLine
SensorMode	{Not Available}
ReverseScanDirection	{Not Available}

Parameters	Instructions
SensorWidth	Sensor Original Image Width (Pixel)。
SensorHeight	Sensor Original Image Height (Pixel)。
WidthMax	Highest Image Width (Pixel)。

Parameters	Instructions
Width	Image Width (Pixel) of Actual Output. Each Camera has the Lowest No. Highest No. And Speed of Yes Width, Down Yes Display in the Attribute column. The Line Camera's RoiModify can be inputed according to the Speed and Lowest No. Width.
Height	Image Height (Pixel) of Actual Output. The Highest No. General is Collect Card Highest Line Height No. Restriction.
offsetX	Image Horizontal Offset
MultipleROI Enable	Multi-Group ROI Enable On/Off
MultipleROI Count	SettingsQuantity for Multi-Group ROI, 1-4G group
MultipleROI Selector	ROI Region
MultipleROI OffsetX	X-axis Offset quantity for multiple Group ROI Splicing.
MultipleROI Width	Width of Multi-Group ROI
Binning	XXy: Combines the sum or Average of the X or y axis Pixels to the Mon Cards Pixel. Department of Minute Model Yes.
BinningMode	Binning Mode, Pixel Merged Hour, Yes Average, Yes Sum, Avg, Sum.
ReverseX	Image Horizontal Flip that Flip Yes is based on Sensor Original Size and No Yes is based on ROI Back's Image.
PixelFormat	Image Output Format 。 Different Model Yes Format is different.
PixelSize	Bits occupied by Mon Cards Pixel based on Image Output Format
TallPixelMode	High Pixel Mode, the Image Sensor y axis Pixel of the dual Line is merged into a Mon Cards Pixel. Department of Minute Model Yes.
TdiMode	Plot Mode: CHG of single Line one _ line and TDIMode
SensorMode	Sensor Mode 。 High Full Well Mode: The Dynamic Range of this Mode Down Camera is wider, which can significantly improve the High Image Clarity and reduce the Noise. It is suitable for the Low Illuminance Ring environment. High Sensitivity Degree Mode: The Mode Down Cameras has better photosensitivity and Brightness.
ReverseScanDirection	Invert Scan Mode
TestImageSelector	Test Image null 1: Close 2: SensorTestImage  NOTE Test Image is not the image generated by Yes Actual Exposure. It is only used for test. The Usage of the Usage Test graph. The Line Height Suggestions is Default Width.

4.3 AcquisitionControl (Collect Management)

AcquisitionControl	
AcquisitionMode	Continuous
AcquisitionStart	{Command}
AcquisitionStop	{Command}
AcquisitionFrameCount	1
AcquisitionLineRate	3,574.00000 Hz
AcquisitionLineRateEn...	False
AcquisitionStatusSelector	FrameTriggerWait
AcquisitionStatus	False
TriggerSelector	FrameStart
TriggerMode	Off
TriggerSource	Software
TriggerFrameCount	{Not Available}
TriggerSoftware	{Command}
TriggerActivation	RisingEdge
TriggerDelay	0.00000 us
TriggerDelaySource	InternalClock
TriggerPostDelay	{Not Available}
TriggerCacheEnable	False
ExposureMode	Timed
ExposureTime	80.00000 us
FrameTimeout	{Not Available}
ResultingLineRateAbs	12,251.14844 Hz

Parameters	Instructions
AcquisitionMode	Collect Mode 。 Yes Continuous Collect, Single Frame Collect, and Multi-Frame Collect.

Parameters	Instructions
AcquisitionStart	Single Frame Collect and multiframe Collect Mode Down, Start Collecting Button.
AcquisitionStop	Single Frame Collect and multiframe Collect Mode Down, Stop Collecting Button.
AcquisitionFrameCount	Multiple Frame Mode Down, Settings Frame Quantity.
AcquisitionLineRate	Collect Line frequency.
AcquisitionLineRateEnable	Collect Line Frequency Enable.
AcquisitionStatusSelector	Select View which triggers Status.
AcquisitionStatus	AcquisitionStatusSelectorMedium Select Acquisition Trigger Wait (Image Collect triggers Wait Status) or FrameTrigger Wait Status), and in the AcquisitionStatusMedium View, True indicates that Wait is triggered, and False indicates that it is.
TriggerSelector	Trigger null Select. After TriggerSelectorMedium Select FrameStart (frame triggered), LineStart, FrameActive, FrameBurstActive,
TriggerMode	(Multi-frame variable frame), and turn on or Close the Trigger Mode in the TriggerModeMedium Select On/Off.  NOTE CXPCameras variable frame is subject to HEI processing due to Protocol Reason.
TriggerSource	Trigger Method. TriggerSourceYes Software Trigger (Software trigger) and lineN (Hardware trigger) and CXPin (Collect Card trigger). • Select Software triggers Hour, click on TriggerSoftwareMedium or Call API to generate Soft Trigger. • Select Hardware triggers Hour at TriggerActivationSetting RisingEdge (Up edge trigger) or Falling Edge (Falling Edge trigger). Then the signal of Up or Falling Edge generated by Back external Cable can be completely hard triggered.  NOTE AcquisitionStart and FrameStart can Minute open Select Trigger Source.
TriggerSoftware	Soft Trigger Button .
TriggerActivation	Signal Rising Edge or Falling Edge trigger.

Parameters	Instructions
TriggerDelay	Trigger Delay 。 It refers to the Time when Cameras receives the To trigger signal and the To trigger takes effect. It will take effect for Trigger Source Yes Soft Trigger or hard trigger.
TriggerDelaySource	Trigger Delay Signal Source 。
ExposureMode	Exposure Time Mode, Yes Timed and TriggerWidth. • Timednull Exposure Time the Time of Yes ExposureTimeSettings. • Trigger Pulse Width outside Yes Trigger Widthnull Exposure Time.
ExposureTime	Cameras Exposure Time 。
FrameTimeout	Frame Time out.
ResultingLineRateAbs	Current Status Cameras theory Frame Rate.  NOTE Camera Current Status Theoretical Frame Rate depends on Network Transmission Bandwidth, Pixel Format, Image Resolution, and Exposure Time. Camera Default Exposure Time Excellent first, that is, when the Multiplicative Inverse Hour of the Exposure Time Greater than Frame Rate, Excellent will reduce the Low Frame Rate first, but not Yes Restriction Highest Exposure Time.

4.4 AnalogControl (Analog Control)

In this Attribute Medium, Line adjustment can be performed on the Image Analog signal of Camera Collect To, including Gain, HEI Level, WB, Gamma correction, etc. Attribute Yes sensor internal Attribute of its Medium Analog Gain.

Actual takes the Hour of the outflow diagram, then Yes advances Line Fpn correction, then Back subtracts HEI Level, and the most Back inputs Line to correct the RGB Minute amount, which is Yes WB.

AnalogControl	
GainSelector	All
GainRaw	1.00000
AnalogGain	1.00000
BlackLevelSelector	DigitalAll
BlackLevel	-32
GammaEnable	False
Gamma	1.00000

Parameters	Instructions
GainSelector	Temporarily No Setting Channels Gain, Default is All.
GainRaw	Number Gain 。 The larger the Gain No. Is, the brighter the Image is. The Settable range of different Models is different. The Default No. Is 1.
AnalogGain	Analog Gain 。 Default is 1.
BlackLevelSelector or	HEI Level Settings 。 CXPCameras Only Yes Number ALL
BlackLevel	HEI Level Value Settings 。
GammaEnable	Image Gamma No. Enable 。
Gamma	For Settings Image Gamma No.

4.5 LUTControl (Lookup Table Management)

In this Attribute Medium, the gray Degree range of interest can be stretched by Line and highlighted by etc. Operation. Operation can be Yes Line or Yes Custom Mapping Line

LUTControl	
LUTEnable	False
LUTSelector	Luminance
LUTIndex	0
LUTValue	0
LUTValueAll	{Register}
LUTSet	{Command}

Parameters	Instructions
LUTSelector	Lookup method Select Channel.  NOTE The objective Front is only a Yes Luminance (Brightness) lookup table.
LUTEnable	LUTEnable, enable LUT lookup table Function.
LUTIndex	Number Spot in the LUTIndex Medium Settings Look-Up-Table (LUT) Medium, ranging from 0 to 4095.
LUTValue	Select the LUTIndexBack and the corresponding No. In the LUTValueMedium Settings.
LUTValueAll	Modify the Value of the Yes Index to the same Mon Value.

4.6 DigitalIOControl (Number I/O Management)

In this Attribute Medium, you can manage different I/O input or Output signals.

LineSelector	Line1
LineMode	Input
LineInverter	False
LineStatus	True
LineStatusAll	31
LineSource	{Not Available}
LineFormat	RS422
LineDebouncingPeriod	0.00000 ns
LineDetectionLevel	{Not Available}
LineResistanceEnable	Enable
LineEncoderType	{Not Available}
UserOutputSelector	UserOutput0
UserOutputValue	False
UserOutputValueAll	0

Parameters	Instructions
LineSelector	Used to Select the external IOLine to be inputed into Line Config.

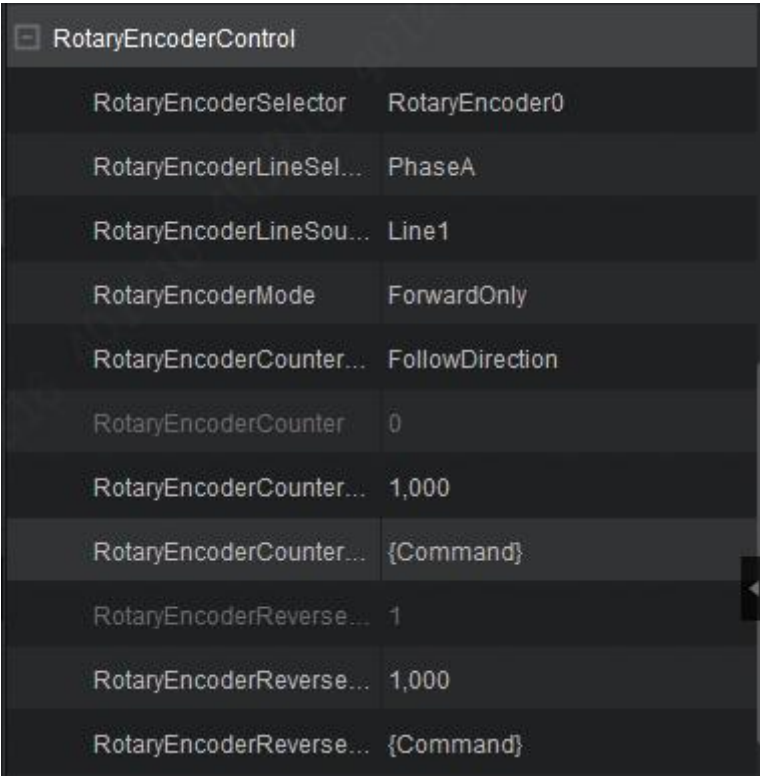
Parameters	Instructions
LineMode	Output mode of IOLine of Config Current Status Select: input or Output.
LineInverter	The signal Invert used to Control the selected physical input or Output Line. True means that the signal is inverted. False means that the signal is not inverted.
LineStatus	Current Status indicating the selected physical input or Output Line.
LineStatusAll	Current Status of Yes Available Line for Back.
LineSource	When Select IOLine is Output Hour, you can Select Trigger Source. The Trigger Source Yes of Front Yes are as follows: ExposureActive: Exposure Start Hour Output signal. FrameTrigger Wait: Output frame triggers the Wait Status signal. Timer0Active: Counter 0 Full Hour Output signal. UserOutput0: No. Of Output User Custom 0Settings. FrameActive: Variable frame signal.  NOTE Notes Output 1 indicates that the optocoupler is on, and 0 indicates that the optocoupler is Disconnected.
LineFormat	IOLine for Display Current Status Select triggers null: single End or Bad Minute.  NOTE When switching between single-ended and differential, MV prohibits pulling streams and the statistics are cleared after switching.
LineDebouncerTime	Length of Settings Debounce Time when IOLine is input Hour.  NOTE A Pulse in the Less than Setting No. Is not considered to trigger an input in the Yes Mon Cards Valid.
Line Detection Level	Single End signal Hour, threshold Voltage Settings.
UserOutputSelector	User Custom Output Group Select .
UserOutputValue	Output Value corresponding to the Custom Group of User Select.
UserOutputValueAll	The No. Of Yes User Custom Group Output for Setting is 0 or 1.

4.7 Frequency Converter Control (Minute time frequency)

FrequencyConverterControl	
FrequencyConverterSel...	FrequencyConverter0
InputSource	Line1
SignalAlignment	RisingEdge
Divider	1
Multiplier	1

Parameters	Instructions
FrequencyConvert erSelector	Minute times frequency
InputSource	Signal Source for Minute times
SignalAlignment	Signal Calibrate
Divider	Minute frequency
Multiplier	Time frequency

4.8 RotaryEncoderControl



Parameters	Instructions
RotaryEncoderSelector	Rotation Encoder
RotaryEncoderLineSelector	Phase Select
RotaryEncoderLineSource	Signal Source Select
RotaryEncoderMode	Out of Frame Mode
RotaryEncoderCounterMode	Counting Mode
RotaryEncoderCounter	Counter Statistics No.
RotaryEncoderCounterMax	Counter Reset No.
RotaryEncoderCounterReset	Counter Reset
RotaryEncoderReverseCounter	Reverse Counter Statistics No.
RotaryEncoderReverseCounterMax	Reverse Counter Reset No.
RotaryEncoderReverseCounterReset	Reverse Counter Reset

4.9 Transport LayerControl

NumberOfLink	Cxp_2links
LinkSpeed	Cxp_6Gbps
DefaultNumberOfLink	Cxp_4links
DefaultLinkSpeed	Cxp_6Gbps
TestMode	0
TestErrorCountSelector	0
TestErrorCount	0
TestPacketCountTx	0
TestPacketCountRx	0
ElectricalComplianceTest	0
DeviceTapGeometry	Geometry_1X_1Y
Image1StreamID	0

Parameters	Instructions
NumberOfLink	Current Status Yes Chain Channels
LinkSpeed	Current StatusChain Channels Speed
DefaultNumberOfLink	Default Chain Channels Quantity
DefaultLinkSpeed	Default Chain Channels Speed
TestMode	Test Mode On/Off
TestErrorCountSelector	Receive Error Count Select
TestErrorCount	Receive Error count
TestPacketCountTx	Number of Test Bags for Send
TestPacketCountRx	Receive Test Bag
ElectricalComplianceTest	Electromagnetic Compatibility (EMC) Test
DeviceTapGeometry	Outflow structure

4.10 ISPC ontrol (ISPManagement)

ISPControl	
ContrastType	Linear
Contrast	50
ContrastThreshold	128
FPNCalibrationStatus	True
FPNRoiCount	1
FPNRoiSetSelector	First
FPNRoiStart	0
FPNRoiWidth	16,384
FPNEnable	Off
FPNBlackCalibration	{Not Available}
FPNBrightCalibration	{Not Available}
FPNCalibrationModel	Maximum
FPNTargetValue	{Not Available}
FPNLowPassFilter	Off
FilterSize	3

Parameters	Instructions
ContrastType	Contrast null Select, straight Line and curved Line.
Contrast	Contrast Value 。 Range: 0 ~ 100, Default 50, for None Contrast.
ContrastThreshold	Contrast Intensity Threshold 。 Range: 0 ~ 255, Default 128.
FPNRoiCount	Number of Groups in Settings ROI, range: 1 ~ 4G group
FPNRoiSetSelector	Select needs ROI Group of Settings Parameters: Range: 1 ~ 4. Range varies with the Value of FPNRoiCount.
FPNRoiStart	The starting Spot of X for the Select Current Status ROI Region.
FPNRoiWidth	The width of the Select ROI Region.
FPNEnable	FPNEnable On/Off 。

Parameters	Instructions
FPNBlackCalibration	FPNDark Field Correction.
FPNBrightCalibration	FPNBright Filed correction.
FPNCalibrationModel	FPN effect CHG: MaximumHighest effect, Average Average effect, UserCustom effect. Normal Usage Average.
FPNTargetValue	Custom effect No.: 50-240. The Larger the correction, the stronger it is.
FPNLowPassFilter	Low is Filter ing FPNEnable.
FilterSize	Low Pass Filter ing Value.



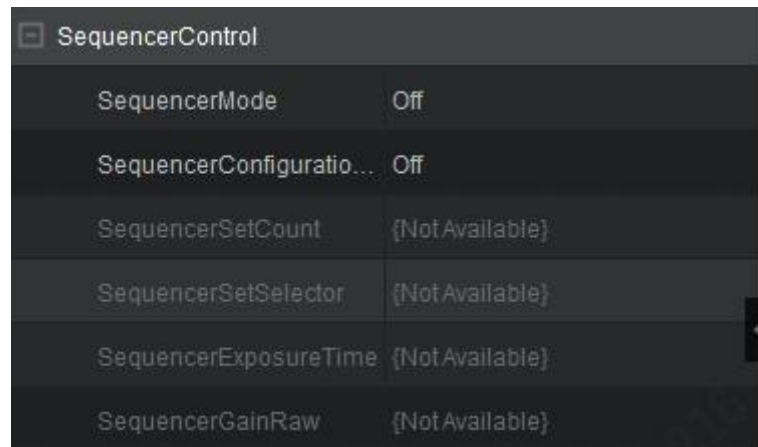
NOTE Multiple ROI Down No FPN correction.

4.11 TimerControl (Timer Control)

TimerControl	
TimerSelector	Timer0
TimerTriggerSource	ExposureStart
TimerTriggerActivation	RisingEdge
TimerDelay	1,024
TimerDuration	4,096

Parameters	Instructions
TimerSelector	Timer for Select to Config
TimerTriggerSource	Trigger Source for Select Start Timer.
TimerTriggerActivation	Trigger Mode for Select Start Timer.
TimerDelay	Used to Set the Time of To trigger Back and Delay multi-Length Start Timer (μs)
TimerDuration	Duration for Settings Scheduled Pulse (μs)

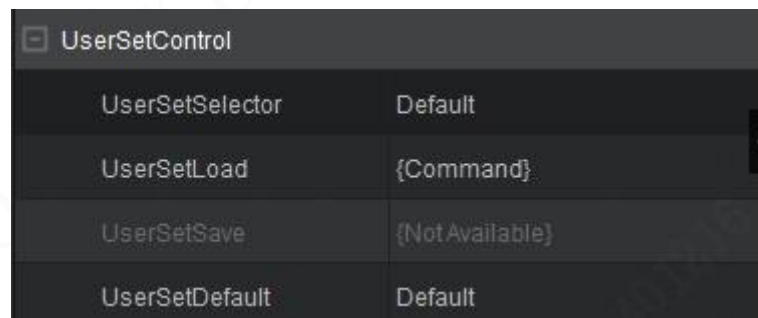
4.12 SequencerControl



SequencerControl	
SequencerMode	Off
SequencerConfiguratio...	Off
SequencerSetCount	{Not Available}
SequencerSetSelector	{Not Available}
SequencerExposureTime	{Not Available}
SequencerGainRaw	{Not Available}

Parameters	Instructions
SequencerConfigurationMode	Polling Config Mode Enable On/Off
SequencerSetCount	Number of polling groups, range: 1 ~ 4G group
SequencerSetSelector	Settings Polled Parameters for each Group
SequencerExposureTime	Polling Exposure No.
SequencerGainRaw	Poll Gain No.

4.13 UserSetControl (User Settings Management)

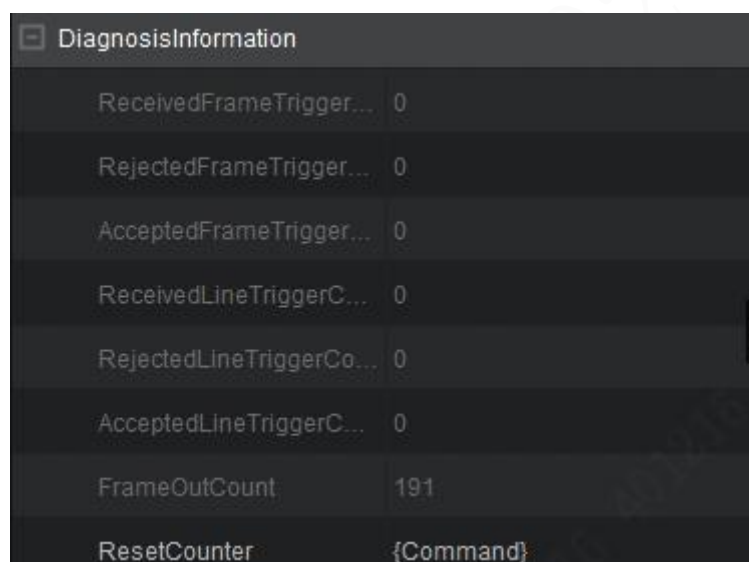


UserSetControl	
UserSetSelector	Default
UserSetLoad	{Command}
UserSetSave	{Not Available}
UserSetDefault	Default

Parameters	Instructions
UserSetSelector	UserSetSelectorUser Setting Group Select . Destination Front Yes Default, UserSet1, UserSet2, UserSet3. Select Usage and Group are used to input Line Back's UserSetLoad and UserSetSave's Operation.  NOTE FPNCoefficient does not remain within To Config. No method Copy to Other Camera.

Parameters	Instructions
UserSetLoad	UserSetLoad User Setting loading. Make Config Undo of Camera become Config of User Select
UserSetSave	UserSetSaveUser Setting Save 。 Select the Config Save To of the Current Status to the Group Medium DefaultGroup No Save.
UserSetDefault	User Settings for Up or Default. UserSet1, UserSet2, and UserSet3 require a Line UserSet SaveBack before they can be displayed here.

4.14 DiagnosisInformation (Diagnosis INFORMATION)



DiagnosisInformation	
ReceivedFrameTrigger...	0
RejectedFrameTrigger...	0
AcceptedFrameTrigger...	0
ReceivedLineTriggerC...	0
RejectedLineTriggerCo...	0
AcceptedLineTriggerC...	0
FrameOutCount	191
ResetCounter	{Command}

Parameters	Instructions
ReceivedFrameTriggerCount	Frame-triggered Quantity for Receive To
RejectedFrameTriggerCount	Reject's Frame Trigger Quantity
AcceptedFrameTriggerCount	Accepted Frame Trigger Quantity
ReceivedLineTriggerCount	Quantity triggered by Receive To Line
RejectedLineTriggerCount	Line of Reject triggers Quantity
AcceptedLineTriggerCount	Quantity triggered by accepted Line
FrameOutCount	Output Frame
ResetCounter	Reset Counter

附录 1 Legal Statement

Trademark Declaration

- A trademark of the VGA Yes IBMCompany.
- Windows Identify and Windows Yes are trademarks of Microsoft Company or Register.
- Other trademarks or Company Name that may be mentioned in this Files Medium are owned by their respective Yes owners.

Responsibility Declaration

- Within the Within Range of the Applicable Law Allow, in any case Down, The Company shall not compensate Line for any Special, incidental, indirect and consequential damages arising from the Files Medium, Close Contents and Description Product. Nor will Line compensate for any loss of profits, Data, Goodwill, Files, or anticipated savings.
- This Files Medium Description Product is provided "as is." Except as required by applicable law, this Company disclaims all warranties, either express or implied, with respect to the Files Medium Description Product. Bag includes all warranties of merchantability, Mass Degree of satisfaction, fitness for a particular Destination, non-infringement of No. WED's rights, etc.

Privacy Protection Reminder

If you install our Product, you may Collect Face, Fingerprint, Plate No., Email, Phone, GPS etc. People information. In the Usage Product process, you need to comply with the Privacy Protection laws and regulations of your Area or Country to protect the legitimate rights and interests of other people. For example, provide a Clear, visible sign to inform Exists of the Close right People Video Monitoring Region and provide the appropriate Contact Mode.

Close to this Files

- The Files are for multiple Cards Model Product Usage, and the Product App earance and Function shall be subject to the material object.
 - Any Loss caused by not following the instructions of this Files Medium to input the Line Operation shall be borne by the User.
 - The Files will Realtime Update Contents according to the laws and regulations of the corresponding Close Area. For details, please refer to the paper, Electron Disc, QR Code or official website of Product. If the contents of the paper file and the Electron file are not the same, please refer to the Electron file.
 - This Company Reserved is accompanied by Hour Modify any INFORMATION rights of this Files Medium, the Modify Contents will be in the XIN Version Medium Connect of this Files, Without further notice to Line.
 - The Files may contain any inaccuracy in the Include technology Up, or any inconsistency with the Product Function and Operation, or any printing error, subject to the Company's final interpretation.
 - If the PDFFiles No method of Get To is Open, please use the Usage Latest Version or the most Mainstream reading Tool.
-

附录 2 Network Security Suggestions

Necessary measures to ensure Device Basic Network Security:

1. And Hour Update Firmware and Client Software

- According to the Standard operation specification of the High-Tech Line industry, the Firmware of the Device needs to update the XIN null and the most XIN version to ensure that the Device has the most XIN Function and Security. Device Connection Public Network Down, Recommended Open Online Update Auto Check for Updates Function, It is convenient for Hour to know the Firmware update XIN INFORMATION of Manufacturer Publication.
- Suggestionsnull and Usage Latest Version Client Software.

Add Suggestions for Strong Device Network Security:

1. Physical Protection

Recommend that you input Line Physical Protection for the Device (especially the Yes Storage Class Device), for example, place the Device in a dedicated machine room or cabinet. And do Good Access Control Permission and Key Management. Prevent unauthorized People from inputting Line to destroy Hardware, external Device (such as USB Drive, Serial Port), etc. Physical contact Behavior.

2. Periodic null

Suggestions You null periodically to reduce the risk of Low being guessed or cracked.

3. And Hour Setting, Update Reset Password INFORMATION.

Device Yes Password Reset Function, in order to reduce the risk of the Low Function being used by an attacker, please Close INFORMATION with the Hour SETTING Password Reset. Include Reserved Mobile Number/Email, Security Question, and Hour Modify for Yes INFORMATION Change. SETTING Security Question Hour, Recommended Usage should not be an Answer that is easy to guess.

4. Open account Lock

input null Default to open the account Lock Function and leave you Enabled to protect the account Security. When the attacker tries Failed Back with multiple time (s) null, the corresponding account and Source IP will be locked.

5. Change HTTP and Other Service Default Port

Suggestions You change HTTP and Other Service Default Port to Any Port between 1024 and 65535 to reduce the risk of Small being guessed by an attacker as a Service Port.

6. Enable HTTPS

Suggestions You turn on HTTPS? Channels of Pass Security to access the Web Service.

7. MAC Address Bind

Suggestions You should put the IP and MAC Address of your Gateway Devices into Line Bind at Devices End to reduce the risk of Low ARP spoofing.

8. Reasonable Minute Allocation Account and Permission

Add User reasonably according to business and Management needs, and configure Lowest Permission Set for its Minute reasonably.

9. Close Mode of non-required Service, Usage Security

If not, you need to Close SNMP, SMTP, and UPnP etc. Function to reduce the risk to Low Devices.

If Yes is required, StrongSuggest your Usage Security Mode Bag, but include All in:

- SNMP: Select SNMP v3 and Set complex Encryption Password and Authentication Password.
- SMTP: Select TLS Method to access Email Server.
- FTP: Select SFTP and Set complex null.
- APHot Spot: Select WPA2-PSKEncryption Mode and Set complex null.

10. Audio/Video Transmission Encryption

If your Audio/Video Data Include is important or sensitive Contents, Suggestions null Encryption Transmission Function, To reduce the risk of Medium theft in the Low Audio/Video Data Transmission process.

11. Security audit

- View Online User: You View Online User irregularly, Recognize Yes No Yes illegal User logged in.
- View Device Log: Pass View log. You can know the IP INFORMATION of the attempted Log in to Device and the Close key Operation INFORMATION of the Logged In User.

12. Network Log

Due to Device Storage Capacity Restriction, Log Storage capability is Limited, if you need Long Term Save Log, Recommend that you Enable Network Log Function, and ensure that the Close key Log Sync null Network Log Server is convenient for Question Backtracking.
