Gidel

Boost your vision!

FantoVision20 Family
Getting Started User Guide

November 2025

North America: 6520 Platt Ave Ste 804, West Hills, CA 91307 + 1-617-849-9220
International: 2 Ha'ilan St., Northern Ind. Zone POB 281, Or Akiva, Israel 3060000 +972-4-610-2500

www.gidel.com

Gidel products and their generated products are not designed, intended, authorized, or warranted to be suitable for use in life-support applications, devices or systems or other critical applications.

North America: 6520 Platt Ave Ste 804, West Hills, CA 91307 + 1-617-849-9220
International: 2 Ha'ilan St., Northern Ind. Zone POB 281, Or Akiva, Israel 3060000 +972-4-610-2500

www.gidel.com

FantoVision20 Family Getting Started Guide

1 Introduction

1.1 Overview

Gidel's FantoVision20™ is a family of compact computers enabling image acquisition and processing from Camera Link, 10GigE Vision and CoaXPress cameras. The FantoVision's architecture merges high-end image acquisition with real-time image processing and/or compression using Nvidia Jetson™ embedded computer with optional pre-processing/compression on Intel Arria 10™ FPGA. The Jetson family can process up to 100 TOPS(INT8) AI using Nvidia's comprehensive libraries. The GPU and FPGA interconnect via 4-lane PCIe capable of grabbing more than 3GB/s. With optional up to 2 Tera Byte SSD, the system can perform demanding real-time processing, compression, transmitting to the cloud, and recording. The FPGA is fortified with up to 10 GB DDR4 at 25 GB/s.

1.2 Models

The FantoVision20 family is offered with a variety of options as detailed below.

The models are **FV[A][B][C][D][E][F]** according to the following table:

A - base model	B - CPU	C - FPGA	D - Cooling	E - Environment Options	F- Storage
20 - Camera Link + 2x10GigE **20CL -** Camera Link **20GV -** 2x10GigE See note (1)	**NX -** Xavier NX **NXM -** Xavier NX-16GB **ORM**- Orin NX-16GB * Other Orin options are valid for quantity > 100 **ORN** – Orin Nano (subject to minimum order quantity)	**16** - Arria10 160 + 2GB **164** - Arria10 160 + 4GB **272** - Arria10 270 + 2GB **27** - Arria10 270 + 10GB **66** - Arria10 660 + 9GB For limitations, refer to note (2).	**A** - Active cooling **Blank** - passive cooling	**Blank** - No option **R** - Extended vibration resistance + Vin range is: 10.8-15.5V **I** - Ambient temperature starting from -25C. This option includes the R option. See note (3).	**Blank** - 100GB+. **-x** - xTB See note (4).

Notes:

1. Gidel also offers the FantoVision40 family supporting 4 x CoaXPress-12 + option for 4 x 10 GigE.
2. With Arria 10 270 or 660 devices, the FantoVision20 supports a single **Camera Link Base only**. The Arria 10 160 device supports **all Camera Link configurations** including **Dual-Base** and DECA 80 bit. For other Camera Link options, contact Gidel.
3. The **I** option is only available with Arria 270 and 4GB on bank A. If you need the **I** version with Bank B as well, contact Gidel Sales.
4. Storage option is 2TB (1920GB). For larger storage contact Gidel

For additional or custom FantoVision models, please contact Gidel.

1.3 Reference Documentation

All Gidel documentation listed in the table below can be found in the following path: */opt/gidel/doc*

Document name	Comment
InfiniVision API Data Book	Describes Gidel's frame grabber API
Gidel GigE API Data Book	Gidel API for use with third-party GigE Vision cameras applications – refer to section 6.
CameraConfig Data Book	Describes Gidel's GenTL camera configuration application
InitCam API User Manual	Describes Gidel's GenTL camera configuration API
Global Regs - Grabber IO Control Data Book	Describes how to configure the FantoVision's I/O functionality
IP Scan API User Manual	Describes the Gidel IP Scan API that enables scanning the FPGA to determine what Gidel IPs are embedded in the current design.
Gidel PofLoader_ReadMe	Describes how to use the PofLoader to program new firmware.
IP Scan Application User Manual	The IpScan application enables scanning the FPGA and automatically identifying the IPs that are currently in the FPGA design.
Operating the Gidel Pattern Generator IP_ReadMe	Describes how to software configure the Pattern Generator IP to generate image patterns in the Gidel grabber's acquisition path.
Reorder API Data Book	For Camera Link cameras only, the document details the API functions for configuring the Camera Link parameters in the acquisition path.
IP Scan Application User Manual	Describes how to use the IP Scan application to identify the firmware design programmed on the board.

1.4 Functional Block Diagram

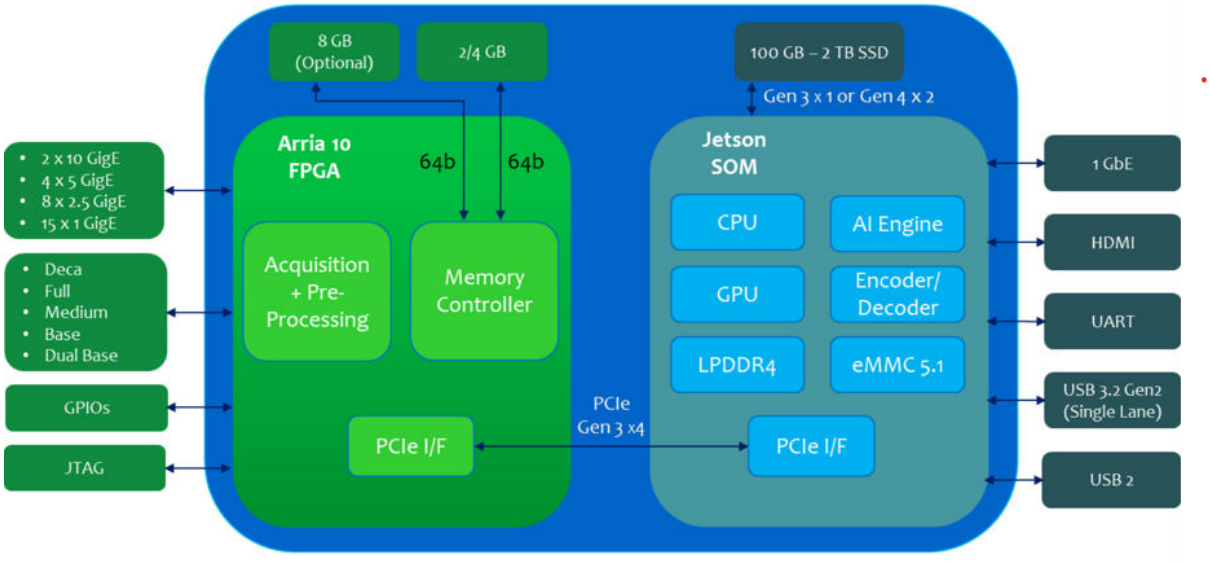


Figure 1: FantoVision20 Block Diagram

Notes:

1. The system comes with several FPGA firmware versions to support different cameras and system setups. For additional information, refer to section 1.5.3.
2. For customized FPGA firmware, user FPGA design customization, or SFP+ unique modules such as SFP+ to SDI, please contact Gidel Sales.

1.5 Familiarizing with the system

1.5.1 FantoVision20 Family Front Panel

The following image shows the FantoVision20™ front panel:

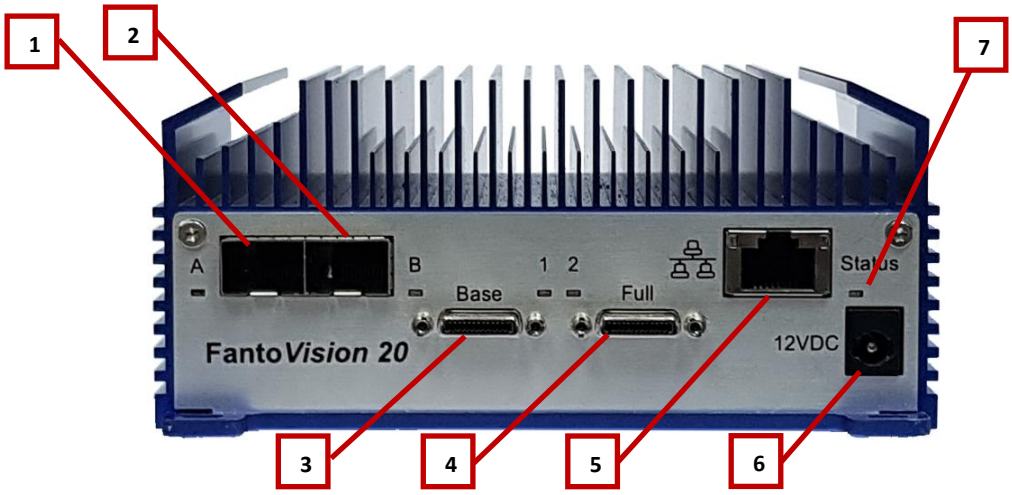


Figure 2 FantoVision20 Front Panel

	Connector name	Description
1.	SFP+_A	SFP+ connector supporting 10 GigE Vision link[1,2,3]
2.	SFP+_B	SFP+ connector supporting 10 GigE Vision link[1,2]
3.	Base	Camera Link Base connector (SDR26)
4.	Full	Camera Link Medium/Full/80-bit connection[4] (SDR26)
5.	Network	Host's 1 GbE network connection
6.	12VDC	External power source connector - (20W typical load @ 12V input voltage)[5]
7.	Status LED	Indicated FantoVision20 power status (refer to Table 2)

Table 1: Front Panel Description

	Led state	Description
1.	Off	No power to the FantoVision20
2.	Steady green	Power on. all power planes are good
3.	Blinking green	Jetson periphery power is disabled
4.	Red	Power-down sequence applied following error detected in power tree
5.	Blinking red	Main current is too high. Upon detection, after 1 second the Jetson periphery is disabled and after 3 seconds the Jetson module shuts down
6.	Orange	Main power failed. After a few seconds, the LED will turn to steady red.

Table 2 Status LED modes

[1] Capable of up to 12 GbpS with dedicated firmware
[2] SFP+ A, B are links 0, 1 in GigE Vision.
[3] The SFP+ MAC addresses are sequential beginning with SFP+ A (the lowest address).
[4] May support a Dual Base connection
[5] 12V (+/- 10%, (+)Inner contact) – must be not shielded. A recommended power supply is: **SMI 36-12 (CUI)**

1.5.2 Rear Panel connectors

The following image shows the FantoVision20 family rear panel:

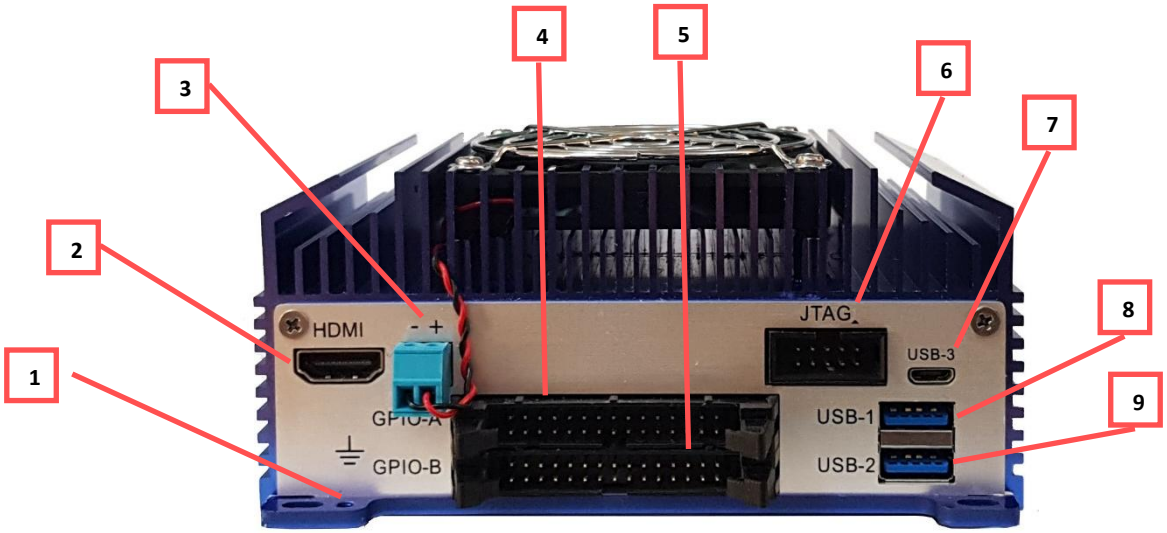


Figure 3 FantoVision20 Rear Panel

	Connector name	Description
1.	Ground (GND)	Screw hole for grounding the FantoVision20*
2.	HDMI	Host's HDMI connector for monitor display
3.	Fan power (optional)	Fan power supply **
4.	GPIO-A	General purpose I/Os
5.	GPIO-B	General purpose I/Os
6.	JTAG	JTAG connector for debugging the FPGA
7.	USB-3	Jetson USB recovery mode or USB serial connection. For additional information on recovery mode, refer to section 10. For additional information on remote connection, refer to section 7.
8.	USB-1	USB 2.0 connection to host
9.	USB-2	USB 3.2 Gen 2 (Single Lane)

Table 3: Rear Panel Connector Description

* When mounting a grounding screw, the paint coat on the hole should be removed.

**The fan power is 12 V with a maximum current of 1.0A aggregate, utilized by the 12V GPIO-A, 12V GPIO-B, and the 12 V external fan power. The default fan provided with the FantoVision20 active cooling models, requires up to 0.3 A. For more information, refer to Table 9 and Table 10.

The mating connectors' specifications are as follows:

	Connector name	Mate Description	Part Number
1.	12VDC	DC Power Connectors 2.5 x 5.5 mm with locking mechanism	CUI Devices: PP-2555TL-M
2.	Fan power*	2 Poles, Pluggable, 180° Insertion Entry, 3.81 Pitch, 28~16 (AWG), Terminal Block Connector	CUI Devices: TBP02P1-381-02BE
3.	GPIO-A and GPIO-B	IDC, 30-pin, 100mil (Plug on the FantoVision: Omron XG4A-3039-A)	Mating options -Omron: XG5 IDC family for discrete wires or XG4 for strain relief.

Table 4: GPIO and Fan Power Specifications

*For FantoVision20 without a fan, you may mount this connector to control your own external fan in a similar manner to connector 3 shown in Figure 3

1.5.3 Firmware

The FantoVision20 firmware can be reprogrammed to support different frame grabbing configurations or to update the firmware. The table below details the firmware options. The firmware files can be found in the following folder: */opt/gidel/firmware/FDB16*. The firmware available are respective to the FantoVision20 model purchased (see section 1.2 Models). To reprogram the firmware, use the **PofLoader** utility in the *utils* folder. For explanation on using the **PofLoader**, refer to the ***PofLoader_ReadMe*** document.

	Firmware file	Description
1.	**FV20_cl_iv_dual_base_build3.pof**	2 x InfiniVisions with a Camera Link Base per each InfiniVision
2.	**FV20_cl_iv_full_build3.pof**	1 x InfiniVision with Camera Link Full
3.	**FV20_gv_iv_15_cameras_build7.pof**	1 x InfiniVision with up to 15 GigE cameras and up to 10 GigE cameras per port. All cameras automatically arranged by their port order. For example, for a Port 0 with 4 cameras and Port 1 with 3 cameras, InfiniVision will enumerate the cameras as follows: Port 0 will be 1-4 and Port 1 will be 5-7. All cameras must be synchronized.
4.	**FV20_gv_iv_link_aggregation_build7.pof**	InfiniVision with 1 GigE camera with an option for link aggregation from 2 ports for a single image.
5.	**FV20_gv_iv_x2_build7.pof**	2 x InfiniVisions with the 1st InfiniVision supporting up to 6 GigE cameras from Port 0, and the 2nd InfiniVision supporting up to 3 GigE cameras from Port 1. Both ports are separated so they do not need to be synchronized; synchronization is only required on the same port.
6.	**FV20_cl_full_gv_x2_iv_x3_build2 (default factory programmed firmware)**	3 x InfiniVisions with the 1st InfiniVision supporting Camera Link Full, the 2nd and 3rd InfiniVisions supporting up to 3 GigE cameras from Ports 0 and 1 (3 per port). Both ports are separated so they do not need to be synchronized; synchronization is only required on the same port.
7.	**FV20_gv_fg_4_cameras_build7.pof**	4 x ProcFG supporting 4 x GigE Vision cameras.
8.	**FV20_gv_fg_link_aggregation_build7.pof**	ProcFG supporting Link Aggregation.

Table 5:Frimware Files

1.5.4 GPIO-A and B Description

The FantoVision20 GPIOs are connected via the GPIO A and B connectors located in the FantoVision's rear panel. The following section provides a description of the system I/Os and their respective pinout.

1.5.4.1 Software Configurable I/Os

FantoVision20 has software programmable I/Os enabling real-time IO functions such as encoders, start/stop grabbing, triggering, and software control. The I/O control is performed via the Global Regs IP. For additional information, refer to the ***Global Regs - Grabber IO Control Data Book.pdf.***

The configurable I/O available are listed in the following table:

I/O	Description
RS-422 diff-pair inputs	<Input> Standard RS422 interface
Opto-Isolators	<Input> Reverse logic
Hi-drive output	<Open Collector Output> High power driver
LVTTL GPIO	<Bi-Dir> Push/Pull, or Open-Collector 3.3V I/O. 5V tolerant (TTL compatible)

Table 6: Configurable FantoVision20 I/Os

1.5.4.2 Additional System I/Os

Additional FantoVision20 I/Os available include:

Type	Connectivity	comment
COM port	Jetson UART0 port.	Connects to /dev/**ttyTHS1**
Jetson Force Recovery	Jetson recovery pin	See section 10
Darlington common cathode	Connects to the Darlington's COM pin	The ULN2803ADWRG4 COM (see Table 8)
2x 12V source	Drawn from FantoVision 12V power rail	Maximum 1.0 A aggregate divided between 12 V GPIO-A/B and the 12V power for the external fan.*

Table 7: GPIOs Functionality

* The default fan provided with the FantoVision20 active cooling models, requires up to 0.3 A.

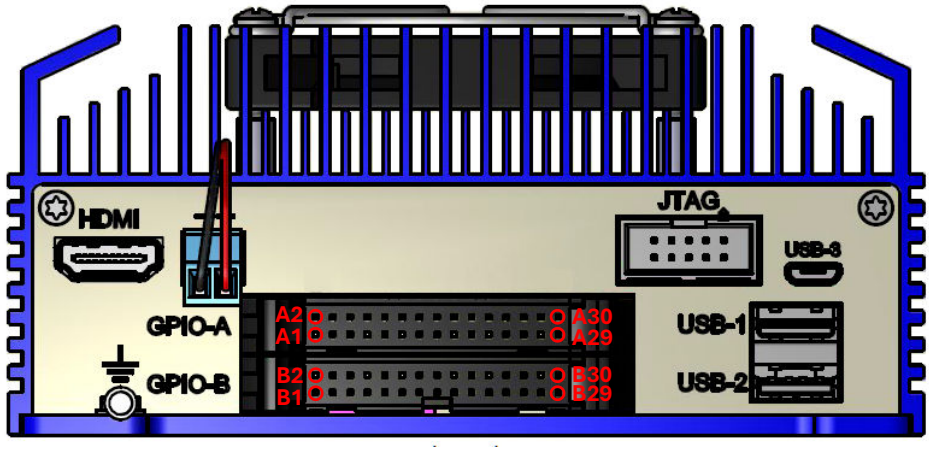
1.5.4.3 I/O Drivers' Devices

The External I/O connectors connect to the following devices:

Device	Manufacturer	P/N
RS-422 Receiver	Texas Instruments	AM26LV32CDR
Optocoupler	Broadcom	ACPL-064L-560E
Darlington Driver	Texas Instruments	ULN2803ADWRG4

Table 8: I/O Drivers-Receivers Devices

1.5.4.4 GPIOs Pin Numbering



1.5.4.5 GPIO-A Pinout

Pin #	Name	comment	Pin #	Name	comment
A1	**DNU**	Do not use	A2	**SHIELD**	Connects to chassis
A3	**Reserved**	Do not use	A4	**Reserved**	Do not use
A5	**Reserved**	Do not use	A6	**Reserved**	Do not use
A7	**Reserved**	Do not use	A8	**Reserved**	Do not use
A9	**Reserved**	Do not use	A10	**Reserved**	Do not use
A11	**Reserved**	Do not use	A12	**Reserved**	Do not use
A13	**UART RX**	RS232 compatible	A14	**UART TX**	RS232 compatible
A15	**GND**	Digital ground	A16	**Reserved**	Do not use
A17	**Reserved**	Do not use	A18	**Reserved**	Do not use
A19	**Reserved**	Do not use	A20	**Reserved**	Do not use
A21	**GND**	Digital ground	A22	**Jetson Recovery**	Jetson FORCE_RECOVERY pin for recovering and cloning the Jetson image – see section 10
A23	**Reserved**	Do not use	A24	**Reserved**	Do not use
A25	**Reserved**	Do not use	A26	**Reserved**	Do not use
A27	**EXT_RESET_IN**	External system reset. Active-low. **(2)**	A28	**DNU**	Do not use
A29	**GND**	Digital ground	A30	**12V output**	Drives up to 1.0 A aggregated with pin B30 on GPIO-B and the 12V external fan power

Table 9: GPIO-A Pinout

Notes:

1. To initiate a reset, you need to ground pin A27. For that purpose, it is recommended to use pin A29. The EXT_RESET_IN signal operates as follows:
    a. Asserting it low for up to 3 seconds performs a soft reset.
    b. Asserting it low for 3 to 6 seconds performs a soft reset and an FPGA reset.
    c. Asserting it low for more than 6 seconds performs a system shutdown.

1.5.4.6 GPIO-B pinout

Pin #	Name	comment	Pin #	Name	comment
B1	**DNU**	Do not use	B2	**SHIELD**	Connects to chassis
B3	**RS422_IN[1]+**	Switching Rates Up to 32MHz. See note 2	B4	**RS422_IN[1]-**	Switching Rates Up to 32MHz. See note 2
B5	**RS422_IN[2]+**	Switching Rates Up to 32MHz. See note 2	B6	**RS422_IN[2]-**	Switching Rates Up to 32MHz. See note 2
B7	**Reserved**	Do not use	B8	**Reserved**	Do not use
B9	**Reserved**	Do not use	B10	**Reserved**	Do not use
B11	**Opt_IN[1] Cathode**	Opto-Isolator cathode input. See note 3	B12	**Opt_IN[1] Anode**	Opto-Isolator anode input. See note 3
B13	**Opt_IN[2] Cathode**	Opto-Isolator cathode input. See note 3	B14	**Opt_IN[2] Anode**	Opto-Isolator anode input. See note 3
B15	**Reserved**	Do not use	B16	**Reserved**	Do not use
B17	**ext_io[1]**	3.3 V LVTTL - 5V tolerant GPIO	B18	**ext_io[2]**	3.3 V LVTTL - 5V tolerant GPIO
B19	**ext_io[3]**	3.3 V LVTTL - 5V tolerant GPIO	B20	**Reserved**	Do not use
B21	**SHIELD**	Connects to chassis	B22	**hv_drv_common**	Common cathode node for High-drive outputs (required for inductive loads)
B23	**hv_drv_o[1]**	High drive output. See note 4	B24	**hv_drv_o[2]**	High drive output. See note 4.
B25	**Reserved**	Do not use	B26	**Reserved**	Do not use
B27	**Reserved**	Do not use	B28	**DNU**	Do not use
B29	**GND**	Digital ground	B30	**12V output**	Drives up to 1.0 A aggregated with pin A30 on GPIO-A and the 12V external fan power

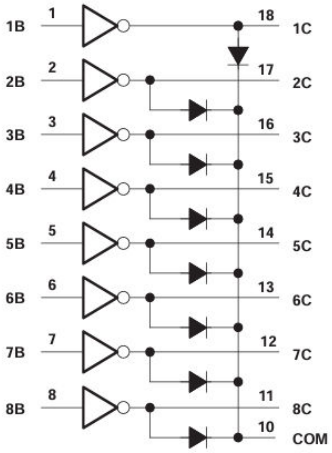
Table 10: GPIO-B Pinout

Notes:

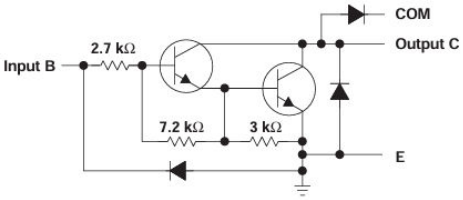
1. Standard RS-422 interface, RS485 receiver with sensitivity of 200mV over (-7.0V to +7.0V) common mode range to allow transmission over up to 1200 meters. Internal pull-up and pull-down resistors prevent output oscillation on unused channels. Up to 10 receivers can be connected to a data bus for multi-drop applications.

2. The input voltage range is 4.5V – 15.5V, and the dynamic resistance range is 2.18KΩ - 2.89KΩ. The optocoupler's operates as follows:
    - When cathode is open => opt_in[ ] = "High"
    - When cathode is GND => opt_in[ ] = "Low"
3. High power driver:

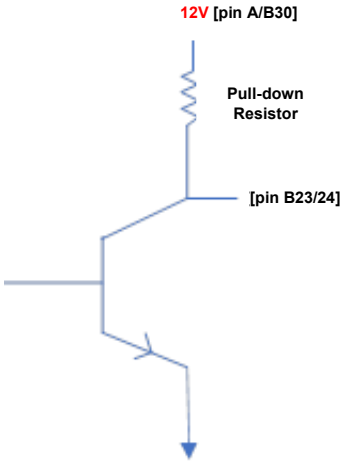
logic diagram



schematic (each Darlington pair)



The Darlington transistor requires a power source connected via a pull-up resistor. For that purpose, you may use connector A or B's pin 30 which delivers 12 V, or an external power source.



When connecting to peripheral devices, note that Darlington's low (zero) state is around 0.9 V and not a TTL standard. The pull-up resistor value should be in accordance with the current required by your application, where, I=(Vsource-0.9V)/R. The pull-up resistor

value should be in accordance with the current required by your application, where, I=(Vsource-0.9V)/R. The maximum current for each Darlington is 0.800 A. The Darlington's logic will operate as follows:

- Hv_drv_o = "High" => ext_out[B23/24] = "Low"
- Hv_drv_o = "Low" => ext_out[B23/24] = "High"

For additional information, refer to the Darlington's data sheet (see Table 8).

Note: If negative input voltage may occur, user must connect the output to a clamping diode.

2 Setting up the system

To setup the system, connect the peripheral devices as follows:

Peripheral device	To connector:
Keyboard	USB-1 or USB-2 (not required with remote access). It recommended to use wired keyboard (refer to chapter 8).
Mouse	USB-1 or USB-2 (not required with remote access)
Display	HDMI (not required with remote access)
1 GbE Network (optional)	RJ45
External Fan	Option for fan-less FantoVision20 model for powering an external user fan
Power adaptor	12VDC **Note:** at this stage, do not connect the FantoVision20 to a power outlet nor turn on your power switch.

Connect your cameras as follows:

Camera	Connections
Camera Link camera(s)	Connect the camera(s) to the Base and Full SDR connectors on the front panel
GigeVision camera(s)	1. Insert SFP+ connectors (RJ45-copper/fiber or copper cable) to the SFP+ cages marked A and B. 2. Connect the camera(s) to the SFP+s

3 Powering up the system

After performing all the connections noted above, including connecting the cameras, plug the AC power supply adapter to the power outlet or alternatively turn on your power switch. The system will automatically boot. Select the “gidel” user and click Enter. Enter the following password: “**123456**” and sign in.

Figure 4: FantoVision20 Login Window

Wait for the OS to complete the boot process:

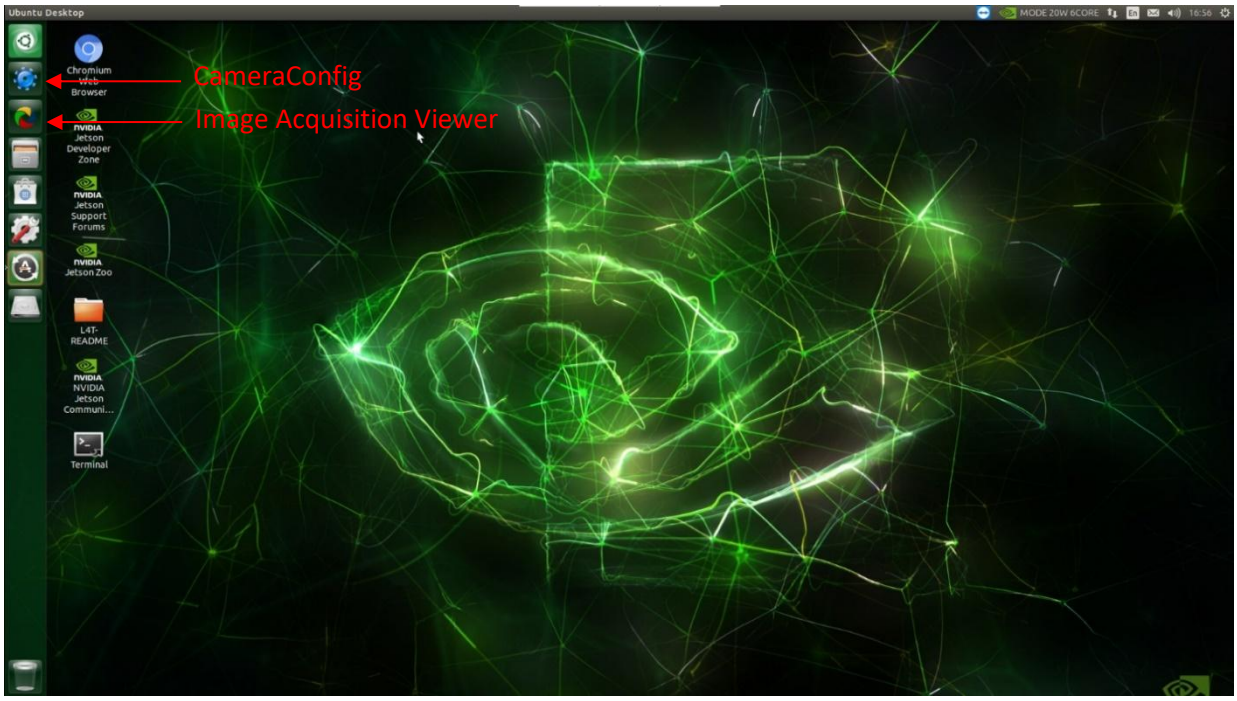


Figure 5: FantoVision20 Desktop Window

4 Camera configuration

4.1 Overview

The following chapter details the core essential steps to configure the cameras, initiate streaming, and display the captured streams from multiple cameras.

CameraConfig, Gidel's GenTL Consumer application, provides configuration and streaming control for GigE Vision, Camera Link (GenCP), and CXP cameras via the GenTL producer. For GenTL camera control via API, refer to the provided examples (see section 8) and to the ***Gidel InitCam API User Manual***. For detailed explanation on configuring and streaming control via the CameraConfig application in Linux, refer to the continuation of this chapter and to Chapter 4 of the ***CameraConfig Data Book***.

Non-GenCP Camera Link cameras must be configured directly or via the Camera Link serial communication as detailed in this chapter. For more information on Camera Link serial communication specification, refer to the

In addition, for all Camera Link cameras, the frame grabber board must be configured via the Reorder IP as detailed in the Camera Link section of this chapter.

4.2 Configuring the camera

For GigE Vision and Camera Link GenCP cameras:

Note: if you are using a non-GenCP Camera Link camera, please refer to the next section, ***For Camera Link cameras***.

1. Before using the CameraConfig to configure your camera(s), you need to define the camera interface in the **GenTLConfig.xml** file. The GenTLConfig.xml file can be found in: **/opt/gidel/bin/GenTLbin64**. Open the xml file in a text editor and define the interface in the following line: **<Feature Name="CameraInterface">1</Feature>.** The camera interface options are: **1** = GigE Vision, **3** = GenCP.
2. On the Desktop, double click the **CameraConfig** application icon to discover the GigE or GenCP Camera Link cameras.

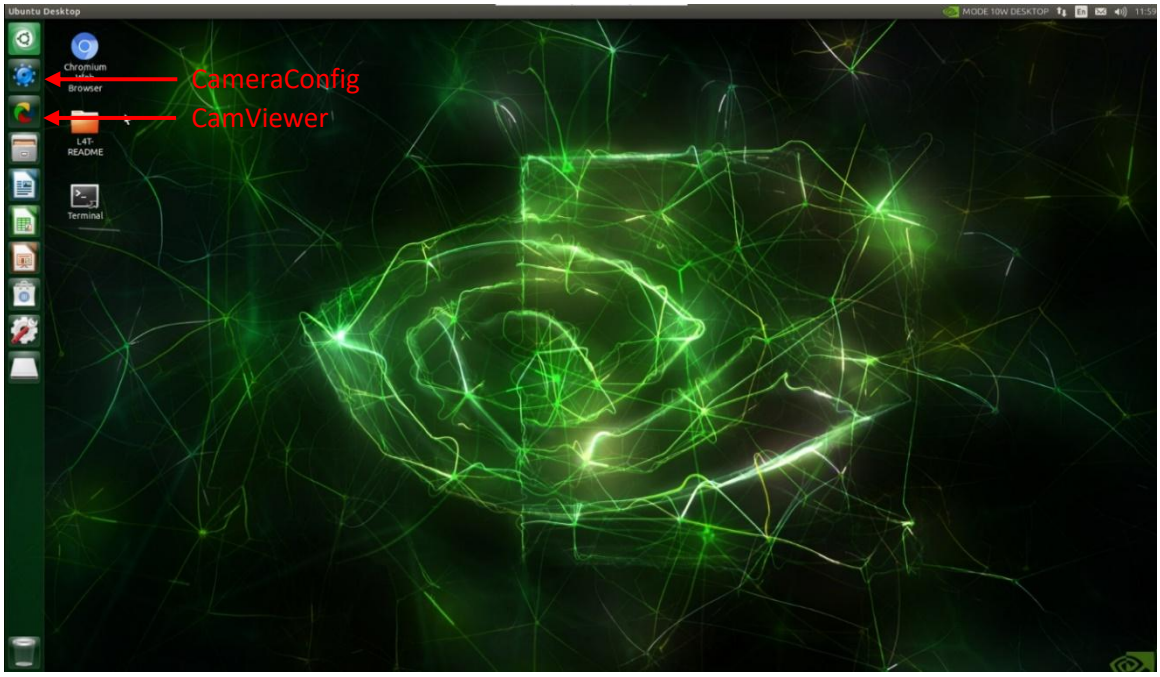


Figure 6: FantoVision20 Desktop

3. Double click on one of the discovered cameras to open the configuration window of that specific camera. In the image below, the cameras are **device_GEV_IP_0** and **device_GEV_IP_1**.

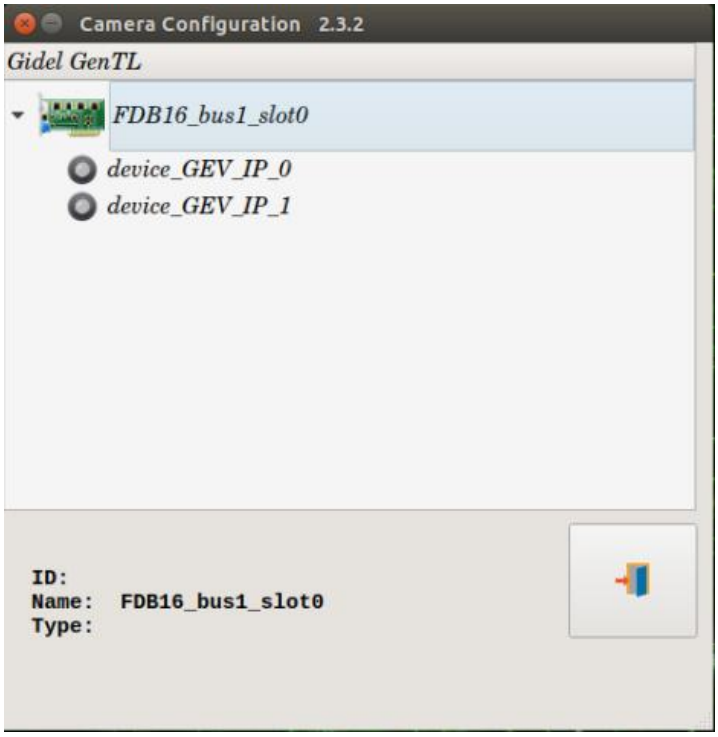


Figure 7: Camera Configuration Window

4. For GigE Vision, if required, configure the camera's IP relative to your network and click **Force IP** or **Set Persistent IP**. Afterwards, In the camera configuration window, click the **Connect** button to connect to the camera.

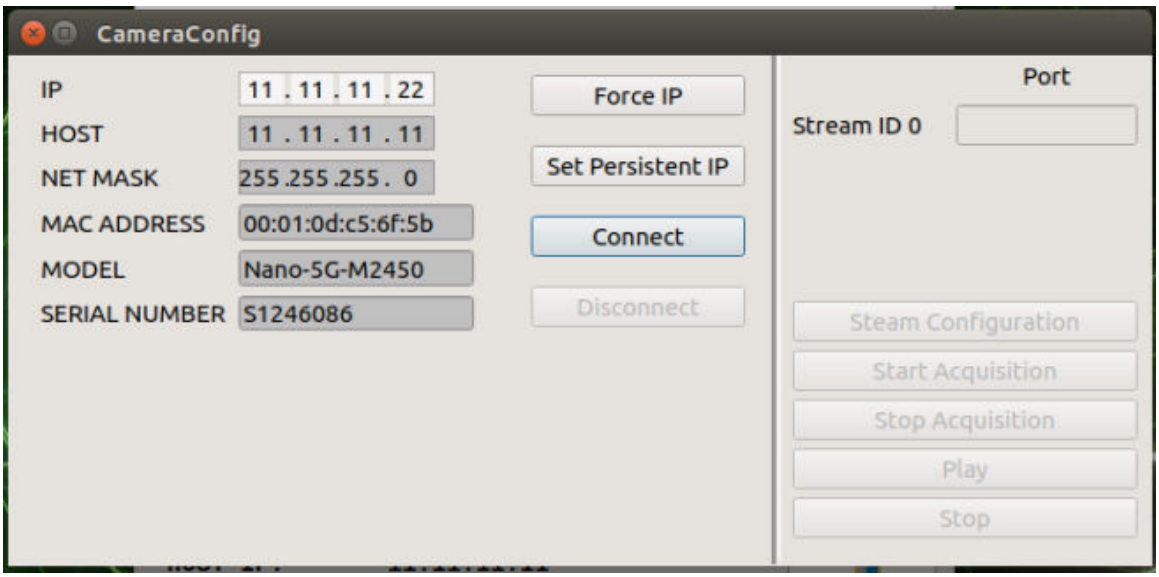


Figure 8: IP Configuration Window

5. Once connecting successfully to the camera, the **Settings** Window will open as shown in the image below.

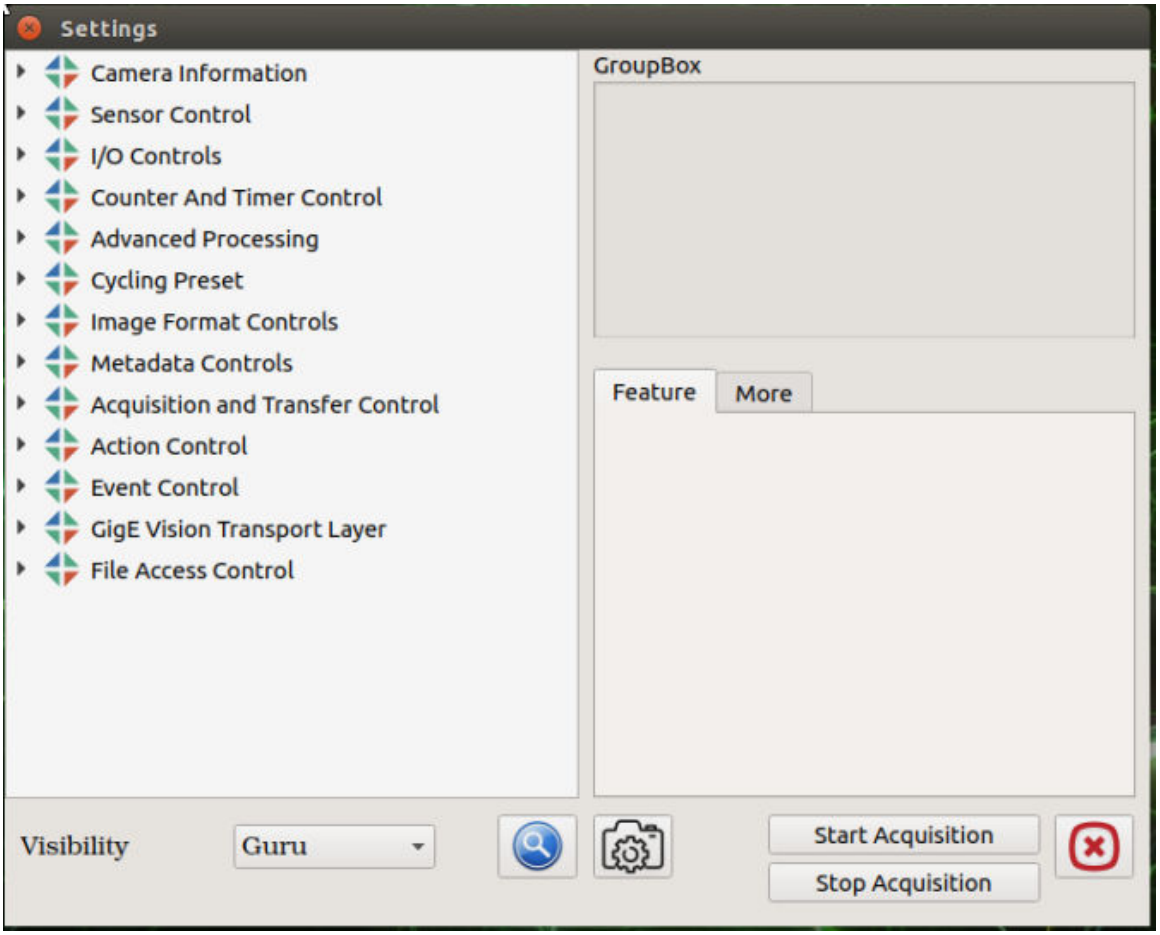


Figure 9: Camera Setting Window

6. Click  to open once again the **CameraConfig** window. Click **Play** or **Start Acquisition** to initiate steaming from the camera. In most cases, depending on the camera manufacturer, clicking **Play** will initiate streaming. Otherwise, you should click **Start Acquisition.**

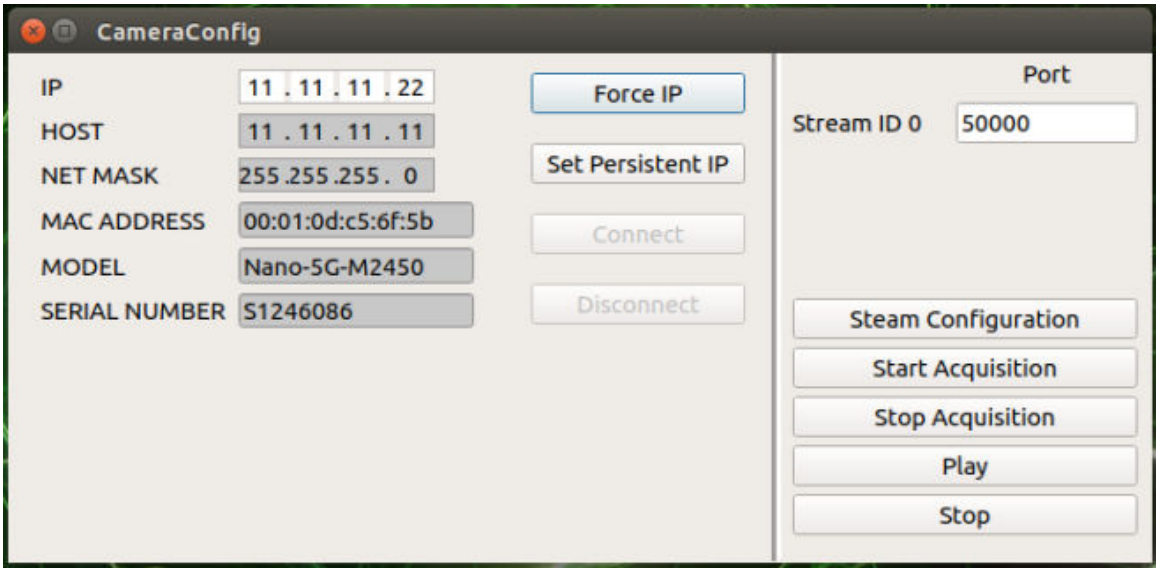


Figure 10: Acquistion Start

7. Close the **CameraConfig** and then the **Settings** windows. After successfully connecting to the camera, the round icon, to the left of the camera, should be green as shown in the image below.

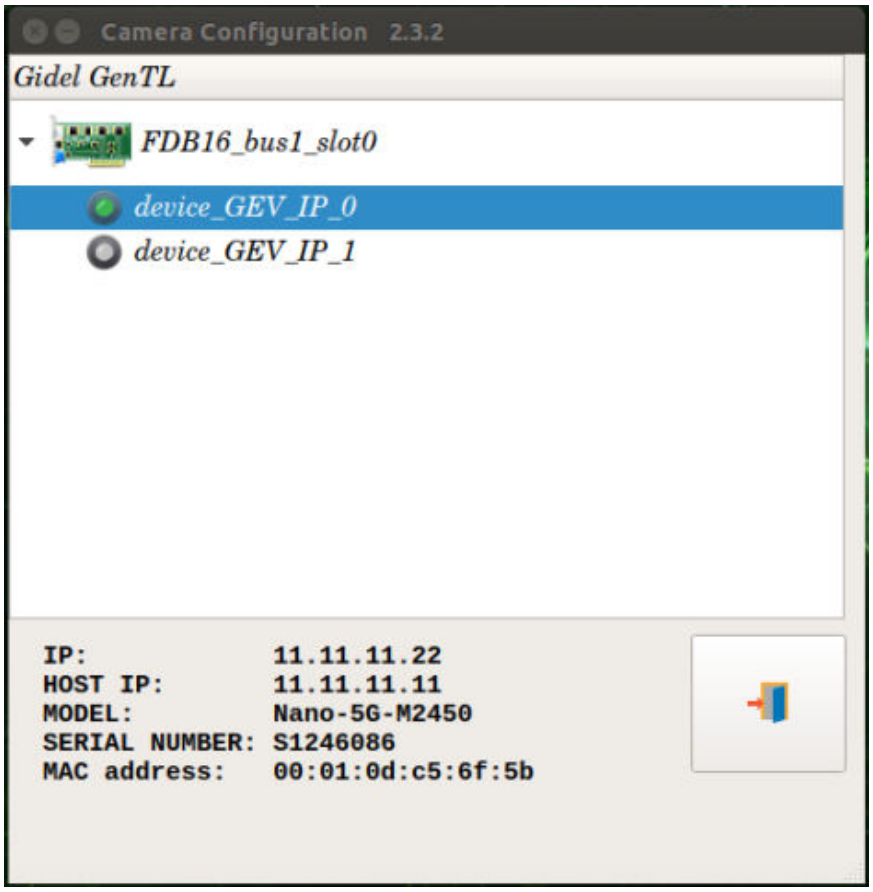


Figure 11: Camera Connected Icon

8. If there are multiple cameras, select the other camera(s) and repeat steps 5 to 9. At the end, the green icon should appear next to all cameras. You have now completed the camera discovery, configuration, and streaming initiation.

For Camera Link cameras:

1. If you are using a non-GenCP camera, you cannot configure the camera via the GenTL. Therefore, you must either one-time configure the camera before using it, or you can use the Camera Link serial communication as explained in the Camera Link protocol. For more information, refer to **Appendix: Camera Link Serial Communication Protocol**. Note: in Linux, the equivalent to Gidel Clser.dll is libclsergdl.so and it is located in /opt/gidel/sdk.
2. When using the Camera Link with InfiniVision, you must configure the acquisition Camera Link parameter via the Reorder API. For more information, refer to the ***Reorder API Data Book.*** In the FantoVision's examples folder, you can find the **ReorderExample** that demonstrates using the API to configure the Reorder.
3. In the case that you are using the Gidel **CamViewer** to display the images, to configure the Reorder's Camera Link parameter, you simply need to edit, via a text editor, the **cl.xml** file. The CamViewer and the cl.xml file are located in: /opt/gidel/bin/GidelCamViewer

5 Running the Image Acquisition Viewer

The Gidel viewer application can be run before or after the camera configuration. However, no window will be displayed until camera is configured and the streaming has been initiated. The viewer application will display all active cameras, so it needs to run only once.

To run the viewer:

1. On the desktop, double click on the  to initiate the CamViewer application.

Or alternatively:

1. Open a new terminal window.
2. Go to the app folder:

```
gidel@gidel-desktop:~$ cd /opt/gidel/bin/GidelCamViewer
```

3. And run the viewer application:

```
gidel@gidel-desktop:/opt/gidel/bin/GidelCamViewer$ ./GidelCamViewer
```

The following keys can be added: GidelCamViewer -v -h, where v = verbosity: print acquisition data information, h = run without image display.

4. If there are multiple cameras, multiple CamViewer windows will appear, each representing a single camera stream.
5. To terminate the program, open Terminal window and then press **Enter** to terminate the program.

6 Configuring GigE Vision Cameras using a 3rd party application

This section provides an example using a third-party application to configure the GigE Vision cameras. The example uses the Pleora eBUS SDK and assumes that the eBUS SDK has been added to: gidel@gidel-desktop:~$ cd /opt/pleora/ebus_sdk.

When OS boot has completed, open a terminal, either by clicking the terminal icon on the desktop icon or by pressing “ALT-CTRL-T” simultaneously. Run the **ggvcon** application. This will setup the host communication with the GigE Vision cameras:

```
gidel@gidel-desktop:~$ ggvcon
```

Next, open a new terminal and go to the folder containing the camera configuration application of Pleora:

```
gidel@gidel-desktop:~$ cd /opt/pleora/ebus_sdk/linux-aarch64-arm/bin/
```

Run the following script:

```
gidel@gidel-desktop:/opt/pleora/ebus_sdk/linux-aarch64-arm/bin$ sudo ./set_rp_filter.sh
```

For the password enter “123456”. When prompted for options, click “Enter” to select the default.

Run eBUS Player, Pleora’s camera configuration application:

```
gidel@gidel-desktop:/opt/pleora/ebus_sdk/linux-aarch64-arm/bin$ sudo ./eBUSPlayer
```

The following window will open:

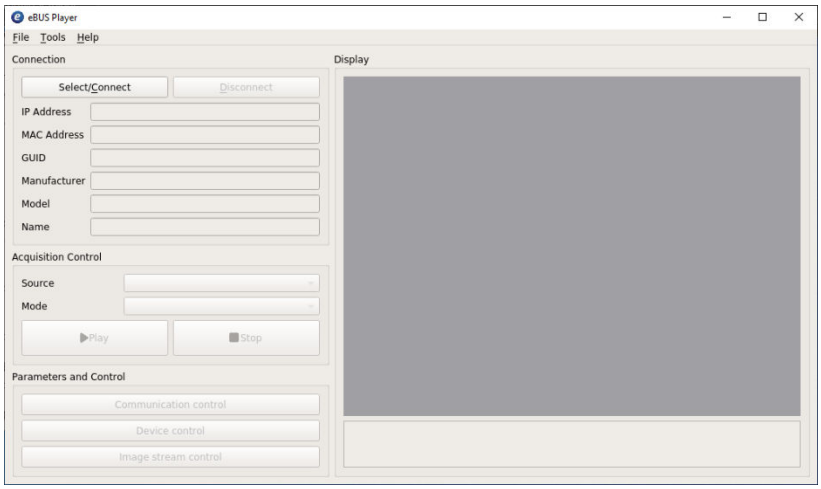


Figure 12: eBUS Player

Configure a streaming port for the camera as follows:

1. In the **Tools** menu select **Setup**. Select “Unicast, specific local port”, and in the port box select a number between 49152 and 65535. Each time you open a new eBUS Player instance to connect to another camera on the same port, you must select a unique number. The setup window should now appear like the following figure:

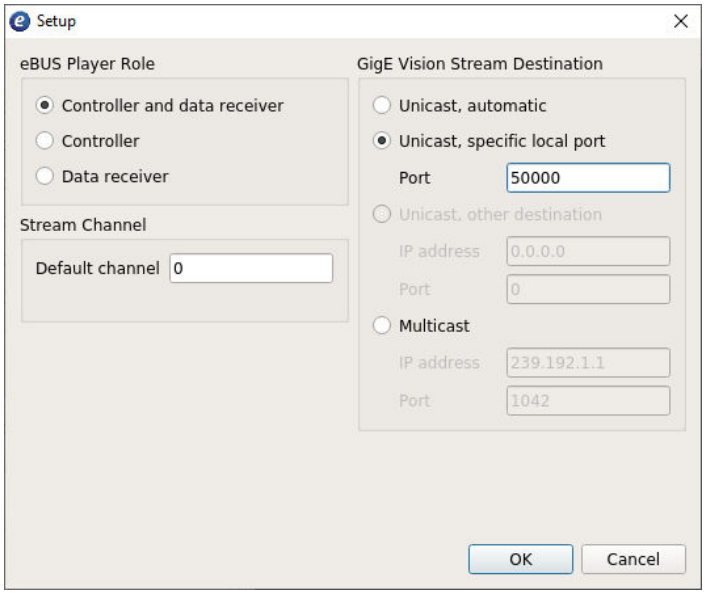


Figure 13: eBUS Setup

2. Click “OK” and return to main menu. Click “Select/Connect” to view a list of the cameras detected. In case the cameras are configure to a different subnet, select “Show unreachable Network Devices” as shown in the following figure:

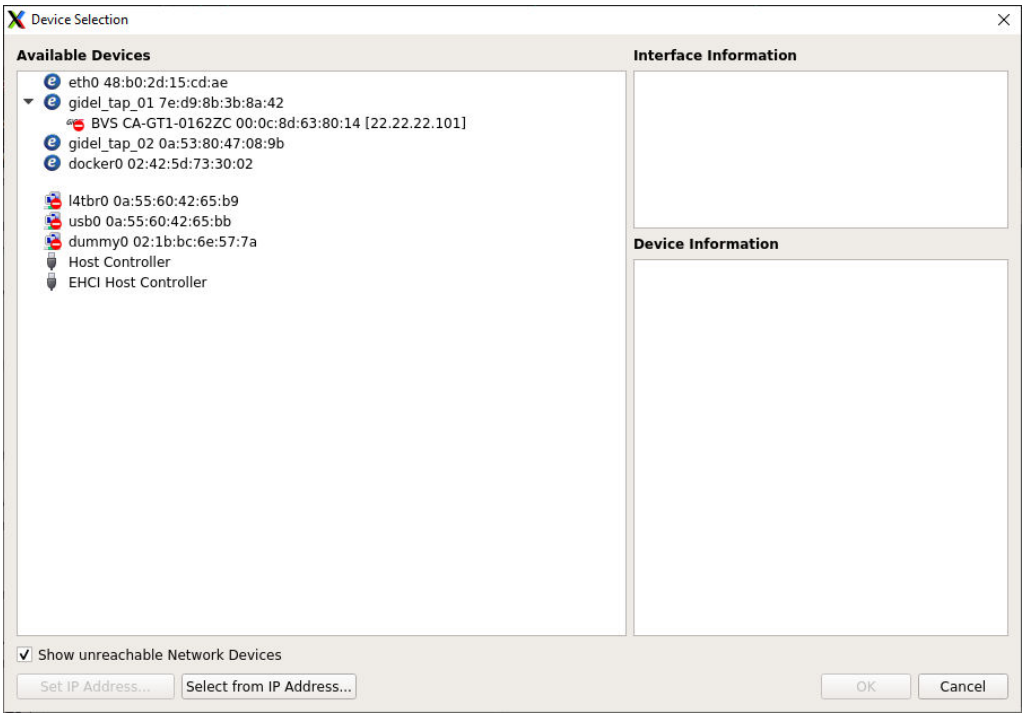


Figure 14: Device Selection

3. Configure the camera IP to match the interface subnet by highlighting the camera and selecting “Set IP Address”. Configure the IP address to reside in the interface subnet (e.g., figure below) and click “OK”.

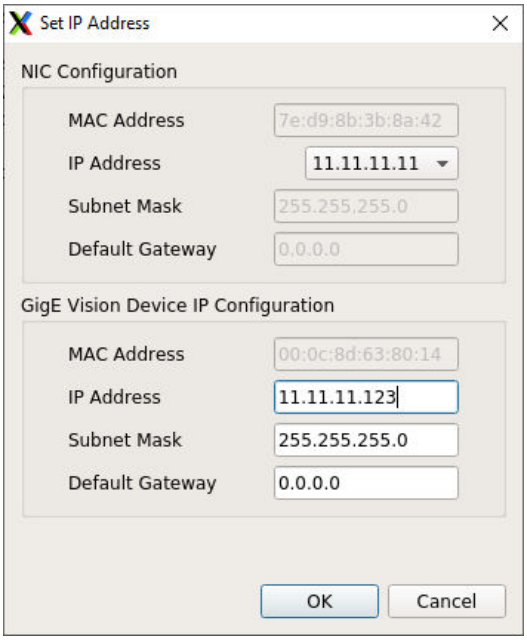


Figure 15: Setting Up the IP Address

4. To connect to the camera, in the “Device Selection” window, double-click on the camera. Connecting to the camera will take a few seconds and then you will be able to select the Parameters and Control buttons: Communication, Device and Image stream, and configure the camera parameters. Click the “Play” button to initiates Image acquisition.

7 Remote connection

It is possible to connect from a remote computer to the FantoVision20 in one of the following ways:

1. Using the 1 GigE port, you may use a remote connection application such as TeamViewer.
2. Using a USB wireless dongle and a remote application as is done with the 1 GigE port.
3. Using the micro-USB port (USB-3) to configure the FantoVision20 via a serial communication (COM port) as detailed in the following section.

7.1 Remote serial configuration

To setup remote serial connection, do the following:

1. Connect PC's USB port to the micro-USB connector (USB-3) on FantoVision's rear panel.

For Windows Operating System:

2. Open the Device Manager on your computer (Windows OS).
3. Powerup the FantoVision20 and wait for a new USB serial device to appear under Device Manager's "Ports (COM & LPT)".
4. Use a serial comm application, such as PuTTY, to connect to the COM port that was added the Device Manager.
5. The Serial configuration parameters are:

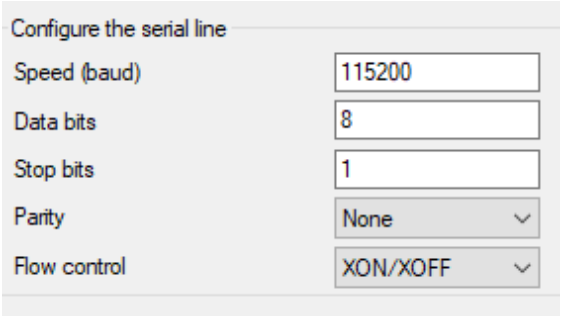


Figure 16: Serial Communication Parameters

6. At this point, you may, for example, use ipconfig to discover the FantoVision's IP and then connect via your PC using a remote connection to the FantoVision's 1G Ethernet port.

8 Connecting an external memory device

When connecting an external memory device via the USB ports, you should adhere to the following guidelines:

1. For optimal performance, the external memory should be connected to USB-2 port with USB 3.1/3.2 Gen 2 (Single Lane) device.
2. When connecting the external memory device to the USB-2 port:
   a. During memory operation, do not use a wireless device via the other USB ports.
   b. For using a wired mouse and keyboard, you may connect a USB hub to the USB-1 (USB 2.0) port.
   c. Alternatively, you may control and monitor the system via the 1G network port.
3. It is not recommended to use NVME m.2 memory.
4. If the memory disk consumes more than 4 W, you must use a memory that receives its power from an external source.

9 Using the examples

The FantoVision's **Examples** folder (/opt/gidel/examples) contains examples demonstrating how to use the Gidel APIs to operate the FantoVision's various functionalities as detailed below:

	Example Name	Description
1.	**InfinVisionExample**	InfiniVision grabber example demonstrating using InfiniVision API for camera acquisition. **Note:** The captured data is transferred directly to the Jetson's joint memory resources that includes the CPU, GPU, AI engine, etc.
2.	**InfinVisionExampleSimple**	Simplified version of InfinVisionExample - acquisition only in first instance of InfiniVision
3.	**InfinVisionExampleSimpleGevConfig**	InfinVisionExampleSimple with initialization of single GigE Vision camera
4.	**InfinVisionMultiFrameExample**	An example demonstrating how to capture multi-frames.
5.	**GidelFrameExtractorExample**	Demonstrates how to extract the multi-frame buffers.
6.	**FgExample**	ProcFG grabber example demonstrating using the ProcFG API for camera Acquisition. *
7.	**GenCPConfigExample**	Camera configuration example for Camera Link with GenCP support
8.	**GevConfigExample**	Camera configuration example for GigE Vision camera interface.
9.	**GGVExample**	A GigE Vision example demonstrating using GGV library to connect between Gidel board and non-GenTL third-party applications.
10.	**GidelDecoderExample**	Example demonstrating decompressing lossless compression files into raw data.
11.	**TestPatternExample**	Test-Pattern example demonstrating initialization of the Gidel test pattern IP.
12.	**TriggerExample**	An example demonstrating the configuration of the frame grabber's triggering.
13.	**ReorderExample**	Data ordering initialization example for CL cameras
14.	**Clser**	Example demonstrating how to use the Clser serial communication.
15.	**ScanIPExample**	An example demonstrating how to use the ScanIP API to scan the current FPGA firmware

* The captured data is transferred directly to the Jetson's joint memory resources that includes the CPU, GPU, AI engine, etc.

For detailed explanation on each example, refer to the inline comments in the example source code and to the following documentation:

	Document	Description
1.	InfiniVision API Data Book	Frame grabber API – refer to 'Grabber' Example
2.	Global Regs - Grabber IO Control Data Book	Software I/O configuration and control – refer to 'Trigger' example
3.	Gidel GigE API Data Book	Gidel API for use with third-party GigE Vision cameras applications – refer to section 6.
4.	Reorder API Data Book	API for configuring the Camera Link acquisition.

10 Recovering and Cloning the Jetson Image

Note: this chapter is for FantoVision based on Jetson Xavier only. For Orin based FantoVision models, contact Gidel.

To recover, clone or flash the image of the Jetson, the Jetson must be in "Forced Recovery mode". The recovering procedure is performed via the mini-USB connector on the FantoVision's rear panel.

To enter recovery mode, you must short pins A21 & A22 of the external IO connector prior to powering up the system. The short should be removed after the power up process has been completed.

10.1 Flashing the Gidel image

To flash a new image, perform the following steps:

1. From the Gidel FTP, download the FV image, *image.tgz*. For more information, contact the Gidel Support.
2. Install JetPack_4.6.3 via the SDK Manager.
3. Untar *image.tgz*.
4. From the image folder, copy *system.img* to <>JetPack_4.6.3_Linux_JETSON_XAVIER_NX_TARGETS/Linux_for_Tegra/bootloader
5. From the image folder, copy the *file gidel_flash* to <>JetPack_4.6.3_Linux_JETSON_XAVIER_NX_TARGETS/Linux_for_Tegra
6. Run sudo ./gidel_flash.

For additional information on how to flash, refer to the NVIDA documentation in the following LINK.

10.2 Cloning the user image

To clone a user image, perform the following steps:

1. Install JetPack_4.6.3 via the SDK Manager.
2. From folder JetPack_4.6.3_Linux_JETSON_XAVIER_NX_TARGETS/Linux_for_Tegra run sudo ./flash.sh -r -k APP -G <your_image_file_name> jetson-xavier-nx-devkit-emmc mmcblk0p1

For additioanl information on how to clone, refer to the NVIDA documentation in the following LINK.

10.3 Flashing the user image

To flash a new user image, perform the following steps:

1. Install JetPack_4.6.3 via the SDK Manager.
2. Copy <you_image_file_name> to JetPack_4.6.3_Linux_JETSON_XAVIER_NX_TARGETS /Linux_for_Tegra/bootloader/system.img
3. From folder JetPack_4.6.3_Linux_JETSON_XAVIER_NX_TARGETS/Linux_for_Tegra run sudo ./flash.sh -r jetson-xavier-nx-devkit-emmc mmcblk0p1

For additional information on how to flash, refer to the NVIDA documentation in the following LINK.

11 Technical Specifications

11.1 Mechanical Specification

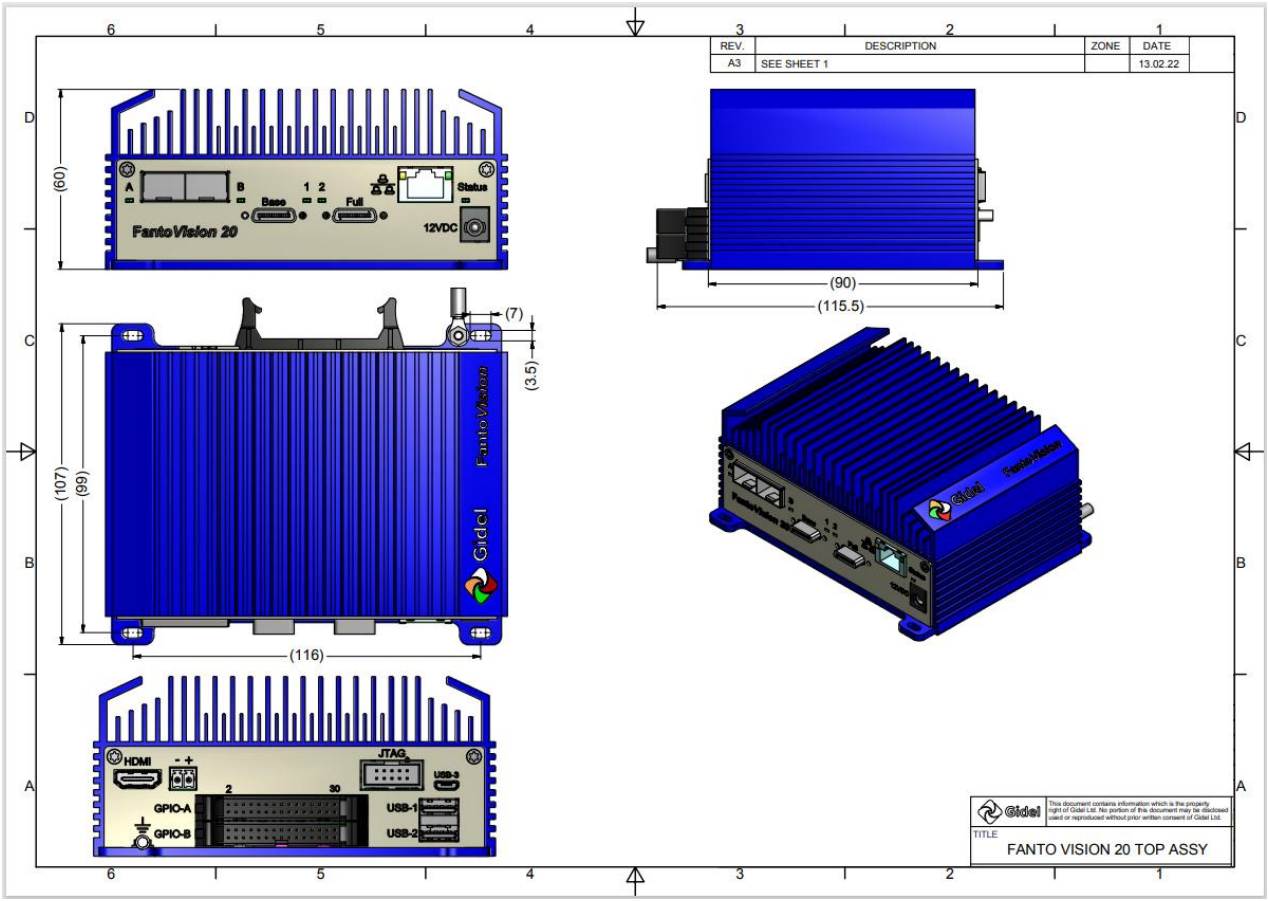


Table 11: FantoVision20 Mechanical Dimensions (mm)

11.2 Electromagnetic Shielding

The following schematic shows the FantoVision20's shielding connectivity:

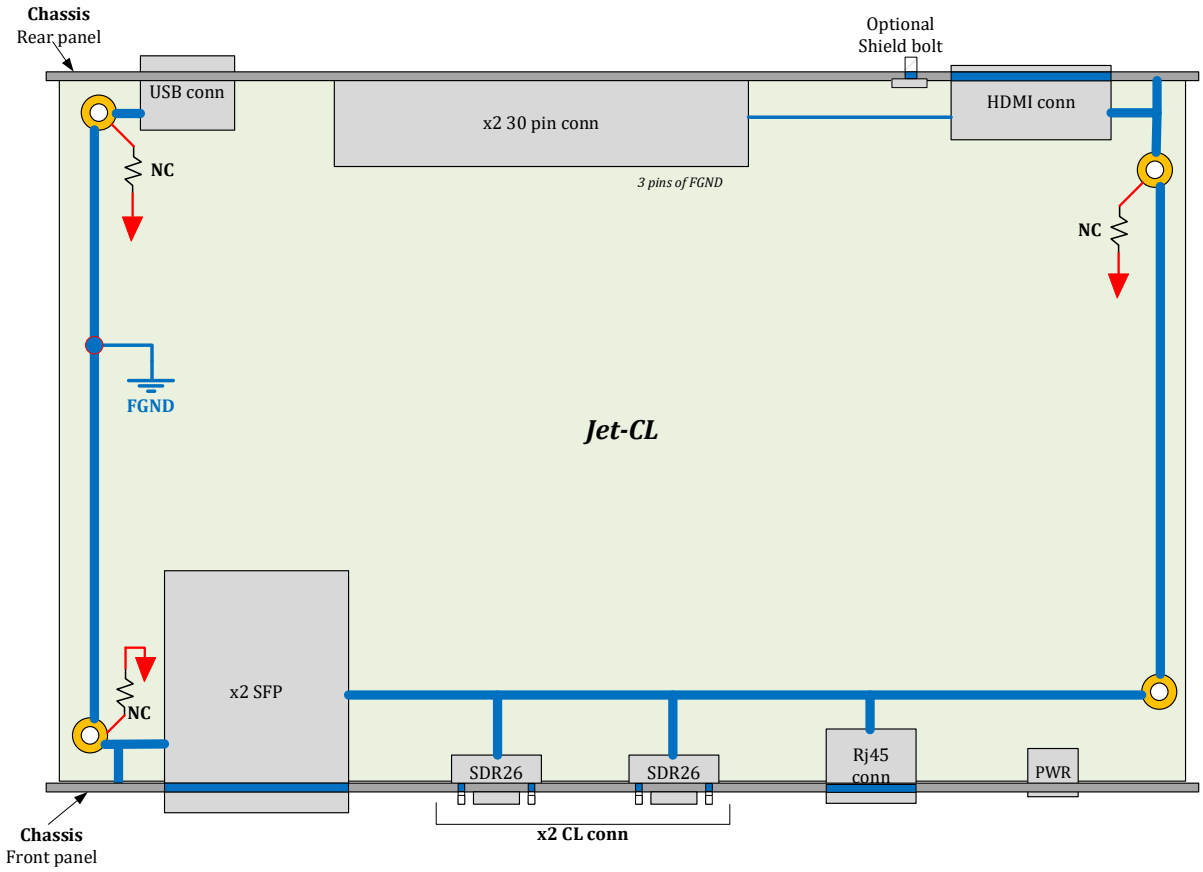


Figure 17: Shielding Schematic

The external bolt on the rear panel may be used for connecting external shielding.

11.3 Power specifications

The FantoVision20 external power supply specifications:

1. **Power**: 20W (typical load @ 12V input voltage for ambient temperature of 45◦ C). Maximum recommended current consumption is 4.0 A.
2. **Polarity**: (+)Inner contact
3. **Tolerance**: +/- 10%
4. **Shielding**: the power source must be of unshielded type
5. **Recommended power supply**: SMI 36-12 (CUI) or any other unit with equivalent specifications.

11.4 Environmental and safety specifications

The FantoVision's environmental and operating specifications:

1. Intended for indoor use only.
2. Wall mounting is limited to 2 meters.
3. Not suitable for use in locations where children are likely to be present.
4. The SFP transceiver's must be safety approved to IEC 60825 and which is CDRH registered
5. Ingress Protection (IP) rating: IP53

12 Appendix: Camera Link Serial Communication Protocol

12.1 Overview

The following is a summary of the Camera Link serial communication protocol. For more detailed explanation, please refer to the ***Camera Link Specifications*** document.

Camera Link **(CL)** is a fast communication interface for vision applications. It utilizes LVDS signal standard (ANSI/TIA/EIA-644) for physical connection. At **Full** configuration, three 28 bit LVDS drivers are used to transfer video data and synchronizing signals. **CL** standard cable includes both LVDS serial communication and LVDS camera control signals.

Two LVDS pairs have been allocated for asynchronous serial communication to and from the camera and frame grabber. These signals are:

• SerTFG—Serial communications to the frame grabber using an LVDS pair.
• SerTC—Serial communications to the camera using an LVDS pair

Cameras and frame grabbers should support at least 9600 baud.

The serial interface has the following characteristics:

- one start bit
- one stop bit
- no parity
- no handshaking

12.2 C/C++ Interface to "clallserial.dll"

An import library, "clallserial.lib", and header file, "clallserial.h", for "clallserial.dll" provides the functions listed in table below which can be called from a C/C++ program.

Name	Prototype
clFlushPort	INT32 __stdcall clFlushPort (hSerRef serialRef)
clGetErrorText	INT32 __stdcall clGetErrorText (const INT8* manuName, INT32 errorCode, INT8* errorText, UINT32* errorTextSize)
clGetNumPorts	INT32 __stdcall clGetNumPorts (UINT32* numPorts)
clGetNumBytesAvail	INT32 __stdcall clGetNumBytesAvail (hSerRef serialRef, UINT32* numBytes)
clGetPortInfo	INT32 __stdcall clGetPortInfo (UINT32 serialIndex, INT8* manufacturerName, UINT32* nameBytes, INT8* portID, UINT32* IDBytes, UINT32* version)
clGetSupportedBaudRates	INT32 __stdcall clGetSupportedBaudRates (hSerRef serialRef, UINT32* baudRates)
clSerialClose	void __stdcall clSerialClose (hSerRef serialRef)
clSerialInit	INT32 __stdcall clSerialInit (UINT32 serialIndex, hSerRef* serialRefPtr)
clSerialRead	INT32 __stdcall clSerialRead (hSerRef serialRef, INT8* buffer, UINT32* numBytes, UINT32 serialTimeout)
clSerialWrite	INT32 __stdcall clSerialWrite (hSerRef serialRef, INT8* buffer, UINT32* bufferSize, UINT32 serialTimeout)
clSetBaudRate	INT32 __stdcall clSetBaudRate (hSerRef serialRef, UINT32 baudRate)

Datatype definitions on Windows operating systems are shown in in the following table:

Defined Data Type	Win 32 Type
hSerRef	void*
Int32	int
UINT32	unsigned int
INT8	char

13 Document Revision History

Date	Changes
February 2022	Initial document
August 2022	• Update the file tree description • Updated the examples description • Added description of .pof files. • CameraConfig updated to support streaming and stream aggregation.
October 2022	• Updated firmware (.pof) files' description
July 2023	• Corrected the description of the EXT_RESET_IN and the FORCE_RECOVERY signals • Updated the description optocoupler and high-drive output (Darlington) I/Os • Updated the explanation on recovering the Jetson image • Updated description of how to operate the CamViewer • Removed description of the FantoVision folder structure
November 2023	• Addition of clarification that data is transferred to Jetson memory space • Minor clarifications • Addition of summary of Camera Link serial communication protocol • Update of Camera Configuration chapter • Update the description of the firmware files
February 2024	• Document formatting correction • Revised section on recovery, cloning, and flashing Jetson image • Added not on removing paint coat when using a grounding screw
February 2025	• Updated models offering description
April 2025	• Updated I/Os description • Expanded technical specification description to include electromagnetic shielding, power, environmental and safety specifications
May 2025	• Minor correction in power specification description
September 2025	• Added description of GPIO pinout map • Added section on using external memory devices • Updated examples list

Date	Changes
November 2025	• Updated the models table to include FantoVision20-CL and FatnoVision20-GigE