

Zebra Clarity UHD™

Installation and Hardware Reference



ZEBRA

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Chapter

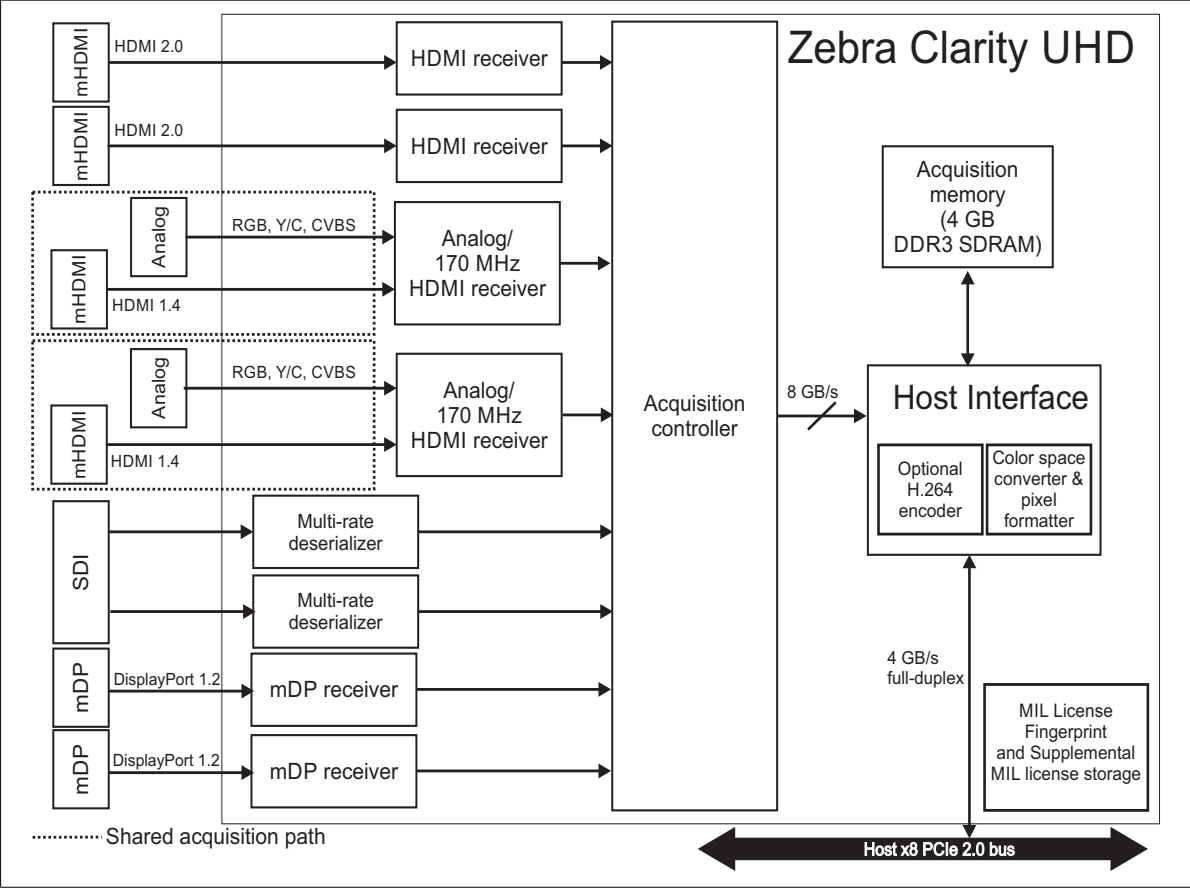
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Introduction

This chapter briefly describes the features of the Zebra Clarity UHD board, as well as the software that can be used with the board.

Zebra Clarity UHD board

Zebra Clarity UHD is a high-performance, PCIe frame grabber for high-definition digital and analog video formats up to 4K in resolution. The board supports standard definition (SD), high definition (HD), and ultra-high definition (UHD) inputs.



General acquisition features

Zebra Clarity UHD has eight independent acquisition paths with up to 8 Gbytes/sec (8192 Mbytes/sec) combined bandwidth to acquisition memory, or 4 Gbytes/sec (4096 Mbytes/sec) to the Host, from 10 connectors. Two sets of connectors (the analog video input and the HDMI 1.4 video input connectors) share the same acquisition paths.

The table below summarizes the supported acquisition video formats on each of the video connectors available:

Video format	Possible video connectors and supported standards				
	Analog	mHDMI		mDP	SDI
		HDMI 2.0	HDMI 1.4	DP 1.2	
Standard analog (RGB, CVBS, Y/C, YpbPr)	X				
Analog high definition (HD)	X				
Digital high definition (HD)		X	X	X	X
Digital ultra-high definition (UHD)		X		X	X

The acquisition paths that support multiple video input formats also support video input from cameras in supported resolutions. The table below summarizes the supported resolutions:

Connector	Standard	Maximum resolution	No. of connectors	Maximum interlaced resolutions
mHDMI	HDMI 1.4	1920 x 1200 @ 60 fps	2	1080i @ 50 fps, 1080i @ 59.94 fps, and 1080i @ 60 fps
	HDMI 2.0	3840 x 2160 @ 60 fps*	2	1080i @ 50 fps, 1080i @ 59.94 fps, and 1080i @ 60 fps
Analog		1920 x 1200 @ 60 fps	2	1080i @ 50 fps, 1080i @ 59.94 fps, and 1080i @ 60 fps
mDP	DP 1.2	3840 x 2160 @ 60 fps*	2	1080i @ 50 fps, 1080i @ 59.94 fps, and 1080i @ 60 fps
HD-BNC	SD-SDI	N/A	2	NTSC: 480i24, 480i30 PAL: 576i25, 576i50
	HD-SDI	HD: 720p50, 720p59.94, 720p60, 1080p23.98, 1080p24, 1080p25, 1080p29.97, 1080p30 2K DCI: 2K 23.98p, 2K 24p, 2K 25p		1080i50, 1080i59.94, 1080i60
	3G-SDI	1080p50, 1080p59.94, 1080p60		N/A
	6G-SDI	UHD: 2160p23.98, 2160p24, 2160p25, 2160p29.97, 2160p30 4K DCI: 4K 23.98p, 4K 24p, 4K 25p		
	12G-SDI	2160p50, 2160p59.94, 2160p60		

*. Higher resolutions might be available. Contact your Zebra representative for more information.

When grabbing from an SDI source into a monochrome 8-bit, YUV16, or BGR32 packed buffer, Zebra Clarity UHD automatically converts the incoming data, selecting the proper color space equations depending on the input resolution (ITU-R BT.601 for SD, ITU-R BT.709 for HD and ITU-R BT.2020 for UHD). Note that, typically SDI streams are natively in YUV format. When grabbing into a YUV16 packed buffer, the input data is not converted.

Other features

Zebra Clarity UHD can offload up to x16 video scaling (up and down) and deinterlacing operations from the Host.

**H.264 encoding
(optional)**

In addition, Zebra Clarity UHD has an optional H.264 encoder, supporting a wide range of video formats. H.264 is a block oriented, motion-compensation-based video compression standard. When the H.264 encoder is present, it allows Zebra Clarity UHD to make better use of its available data transfer rates between the board and the Host. This includes the ability to offload and encode buffers from the Host as well as encoding the video stream from the board.

Acquisition memory

Zebra Clarity UHD has 4 Gbytes of linearly addressable DDR3 SDRAM. This memory is used by the Host interface to temporarily store inquired images and to perform color conversion.

Data transfer

Under optimum conditions, Zebra Clarity UHD's x8 PCIe Host interface can exchange data with the Host at a peak transfer rate of up to 4 Gbytes/sec (that is, 3.2 Gbytes/sec to transfer from on-board memory to Host and 3.0 Gbytes/sec to transfer from Host to on-board memory), preventing video data from inadvertently being discarded. In addition, the point-to-point connectivity of PCIe prevents other add-in devices from consuming valuable bandwidth between your Zebra Clarity UHD and the Host computer.

Software

To operate Zebra Clarity UHD, you can use one or more Zebra software products that supports the board. These are MIL and its derivatives (for example, MIL-Lite and Matrox Intellicam). Zebra software is supported under Windows, while MIL and MIL-Lite are also supported under Linux. Consult your software manual for supported versions of the operating system.

MIL

MIL is a high-level programming library with an extensive set of optimized functions for image capture, processing, analysis, transfer, compression, display, and archiving. Image processing operations include point-to-point, statistical, spatial filtering, morphological, geometric transformation, and FFT operations. Analysis operations support camera calibration, are performed with sub-pixel accuracy, and include pattern recognition (normalized grayscale correlation and Geometric Model Finder), blob analysis, edge extraction and analysis, measurement, image registration, metrology, character recognition (template-based, and for both normal and dot-matrix text, feature-based using String Reader and SureDotOCR respectively), code recognition and grading (1D, 2D, and composite code types), bead inspection (continuous strip of material), 3D reconstruction, 3D processing, 3D analysis, classification, and color analysis.

MIL applications are easily ported to new Zebra hardware platforms and can be designed to take advantage of multi-processing and multi-threading environments.

MIL-Lite

MIL-Lite is a subset of MIL. It includes all the MIL functions for image acquisition, transfer, display control, and archiving. It also allows you to perform processing operations that are typically useful to pre-process grabbed images.

Matrox Intellicam

Matrox Intellicam is an interactive Windows program that allows for fast video source interfacing and provides interactive access to all the acquisition features of your Zebra board. Matrox Intellicam also has the ability to create custom digitizer configuration format (DCF) files, which MIL and its derivatives use to interface to specific non-standard video sources. Matrox Intellicam is included with all Matrox Imaging software products.

Essentials to get started

To begin using Zebra Clarity UHD, you must have a computer with the following:

- An available conventional x8 PCIe slot.
- Processor with an Intel 64-bit architecture, or equivalent.
- A relatively up-to-date PCIe chipset.
- A case with an add-in card connector opening (an expansion slot) that respects the current dimensions of the PCI Express Card Electromechanical Specification Revision 3.0: Standard Height Connector Opening in Chassis.
- A proper power supply. Refer to the *Electrical specifications* section in *Appendix B: Technical information*.
- MIL or one of its derivatives. This software should be installed after you install your board.

Zebra does not guarantee compatibility with all computers that have the above specifications. Please consult with your local Zebra representative, local Zebra sales office, the Zebra web site, or the Zebra Customer Support Group at headquarters before using a specific computer.

Consult your software package for other computer requirements (for example, operating system and memory requirements).

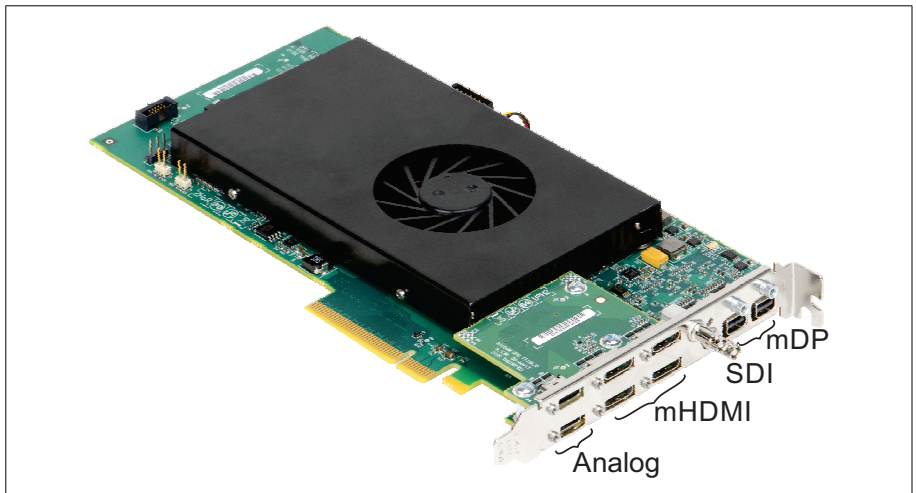
Inspecting the Zebra Clarity UHD package

You should check the contents of your Zebra Clarity UHD package when you first open it. If something is missing or damaged, contact your Zebra representative.

Standard items

You should receive the following items:

- The Zebra Clarity UHD board.



Available separately

You might have also ordered one or more of the following:

- MIL or MIL-Lite.
- Two analog-video-input-to-DVI-I cable adapters, designed to connect your camera's DVI-I connector to the analog video input connector on your Zebra Clarity UHD.

Handling components

The electronic circuits in your computer and the circuits on Zebra Clarity UHD are sensitive to static electricity and surges. Improper handling can seriously damage the circuits. Be sure to drain static electricity from your body by touching a metal fixture (or ground) before you touch any electronic component. In addition, do not let your clothing come in contact with the circuit board or components.

Warning

Before you add or remove devices from your computer, always **turn off** the power to your computer and all peripherals.

Installation

The installation procedure consists of the following steps:

1. Complete the hardware installation procedure described in *Chapter 2: Hardware installation*.
2. Complete the software installation procedure described in the documentation accompanying your software package.

For hardware information, as well as environmental and electrical specifications, and connector pinout descriptions, see *Appendix B: Technical information*.

This manual occasionally makes reference to a MIL-Lite function. However, anything that can be accomplished with MIL-Lite can also be accomplished with MIL.

Need help?

If you experience problems during installation or while using this product, you can refer to the support page on the Zebra website: supportcommunity.zebra.com/s/contactsupport?brand=matrox. The support page provides information on how to contact technical support.

To request support, you should first complete and submit the online Technical Support Request Form, accessible from the above-mentioned web page. Once you have submitted the information, a Zebra support agent will contact you shortly thereafter by email or phone, depending on the problem.

Vision Academy

The Vision Academy online training resource is also available to help customers visualize the steps involved in using various products. For access to these videos, visit the Zebra website.

Chapter

2

Hardware installation

This chapter explains how to install your Zebra Clarity UHD board in your computer.

Installing your Zebra Clarity UHD board

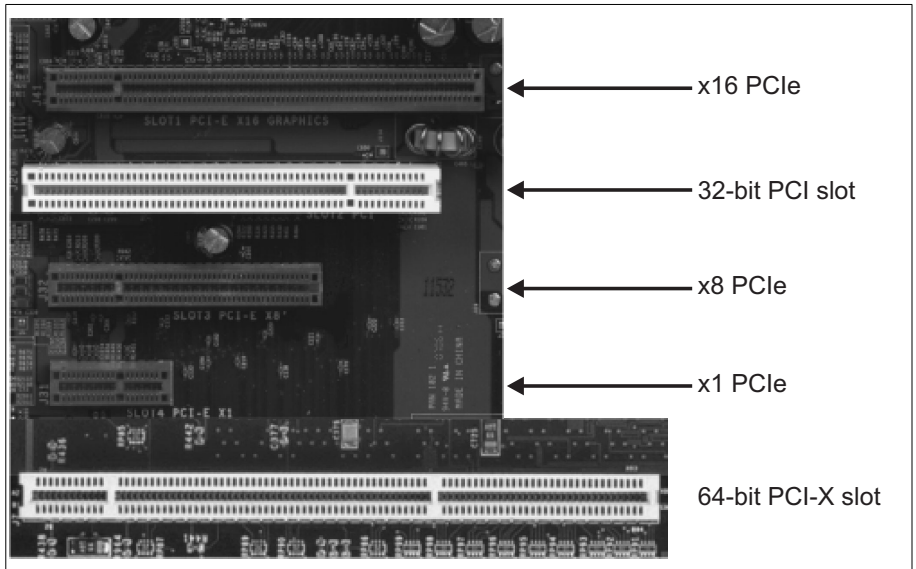
Before you install your Zebra Clarity UHD board, some precautionary measures must be taken. Turn off the power to your computer and its peripherals, and unplug the power cord to drain all standby power. Drain static electricity from your body (by touching a metal part of the computer chassis).

Important

- ❖ Note that your board should be installed before you install your software.

Proceed with the following steps to install your board:

1. Remove the cover from your computer; refer to your computer's documentation for instructions.
2. Check that you have an empty x8 or x16 PCIe 2.0 slot in which to install your Zebra Clarity UHD.



3. If there is a metal plate at the back of the selected slot, remove it. Keep the screw from the top of the plate to anchor your board once it is installed.
4. Position your Zebra Clarity UHD board in the selected slot, and then press the board firmly but carefully into the connector of the slot.

5. Anchor the board using the screw that you removed in step 3.
6. Replace the cover of your computer.
7. Connect any video sources (such as, cameras) to your Zebra Clarity UHD.

Important

- ❖ Ensure that your computer and any peripherals are powered off before adding or removing peripherals.
8. Turn on your computer.
 - ❖ When you boot your computer under Windows, Windows' Plug-and-Play system will detect that the device driver for a Multimedia video device was not installed. This is expected and you should click on **Close**.
 9. Disable active state power management (ASPM) for PCIe devices, to maximize the performance of Zebra Clarity UHD. In the BIOS, disable all ASPM (or equivalent) settings (typically accessible from the **Power management** sub-menu of the **Advanced Configurations** menu). In addition, if the operating system has an **ASPM for PCIe devices** option, disable this option as well. For example, under Microsoft Windows 7, open the **Power Options** dialog box from the Windows Control Panel. For the currently selected power plan, click on **Change Plan Settings** and then click on **Change Advanced Power Settings**. In the presented dialog, expand **PCI Express**, and then expand **Link State Power Management** and set it to **Off**.
 10. Under Microsoft Windows, set the power plan option to high performance to maximize the performance of Zebra Clarity UHD. For example, under Microsoft Windows 7, open the **Power Options** dialog box from the Windows Control Panel and set the power plan option to **High Performance**.

Chapter

3

Using multiple Zebra Clarity UHD boards

This chapter explains how to use multiple
Zebra Clarity UHD boards.

Installation of multiple boards

You can install and use several Zebra Clarity UHD boards in one computer.

Install each additional Zebra Clarity UHD board as you installed the first board (refer to *Chapter 2: Hardware installation*). The number of Zebra Clarity UHD boards that you can install is dependent on the number of physical slots in your computer and your BIOS; your BIOS establishes how many PCIe devices can be mapped to the PCIe memory space of your computer.

Using MIL-Lite, you have to allocate a MIL system for each board and allocate the resources of each MIL system. For more information, see `MsysAlloc()` with `M_SYSTEM_CLARITY_UHD` in the MIL Reference.

Simultaneous image capture from different boards

Besides simultaneously capturing images from up to eight video sources attached to a Zebra Clarity UHD board, you can simultaneously capture images from video sources attached to different Zebra Clarity UHD boards.

The use of a high performance PCIe chipset is necessary to sustain PCIe transfers to Host memory.

To measure the effective, available bandwidth of the PCIe interface used by your Zebra Clarity UHD board, you can use the Clarity UHD Bench tool integrated in the MILConfig utility. As a reference point, capturing from a 3840 x 2160, RGB32, 60 frames/sec video source will require a minimum bandwidth of almost 2 Gbytes/sec.

Appendix A:

Glossary

This appendix defines some of the specialized terms used in the Zebra Clarity UHD documentation.

Glossary

- **Bandwidth**

A term describing the capacity to transfer data. Greater bandwidth is needed to sustain a higher transfer rate. Greater bandwidth can be achieved, for example, by using a wider bus or by increasing the clock frequency at which an interface or a core operates (for example, increasing the DDR SDRAM clock frequency).

- **Bus**

A pathway along which signals are sent, generally in two directions, for communication data.

- **Color space**

A color space is a way of representing and describing the complete range of perceived colors. A number of color spaces have been developed. Common color spaces are RGB and HSL. Both describe the same range of colors.

- **CVBS**

Composite Video, Blanking, and Sync. A composite analog video encoding which encodes the luminance and chrominance video components into one signal.

- **DCF**

Digitizer Configuration Format. A file format that defines the input data format and, for example, how to accept or generate video timing signals, such as horizontal sync, vertical sync, and pixel clock.

Such files have a *.def* extension.

- **DDR3 SDRAM**

Double Data Rate3 Synchronous Dynamic Random Access Memory. A type of memory used for image capture and processing. SDRAM allows Zebra Clarity UHD to access data at very high speed, which is important for I/O-bound functions.

- **Decoder**

A device which separates the various components of a composite video signal and converts the information into digital format.

- **Digitizer Configuration Format**

See *DCF*.

- **Driver**

A software program that services an operating system so that the operating system can use a hardware device.

- **Frame**

A single image grabbed from a video source.

- **Grab**

To acquire an image from a video source.

- **High-definition resolution**

A resolution typically offering up to 1280x720 (720p) or 1920x1080 (1080i/1080p) pixel resolution, where p is for progressive scanning and i is for interlaced scanning.

- **Horizontal synchronization signal**

The part of a video signal that indicates the end of a line and the start of a new one.

See also *Vertical synchronization signal*.

- **Host**

In general, Host refers to the principal CPU in one's computer.

- NTSC

National Television System Committee. An analog, interlaced, color video format standard, typically at 640 pixels x 480 lines (square pixels) or 720 pixels x 486 lines (non-square pixels) resolution, used in North America and most of South America. In NTSC, 30 frames are transmitted each second. Each frame is made up of 525 individual scan lines (rows). While NTSC has a total of 525 lines, only 480 of these are used for the image data.

- PAL

Phase Alternating Line. An analog, interlaced, color video format standard, typically at 768 pixels x 576 lines (square pixels) or 720 pixels x 576 lines (non-square pixels) resolution, mostly used in Europe. In PAL, 25 frames are transmitted each second. Each frame is made up of 625 individual scan lines (rows). While PAL has a total of 625 lines, only 576 of these are used for the image data.

- PCIe

Peripheral Component Interconnect Express. The standard used for the computer bus that acts as an interface between hardware devices, such as Zebra Clarity UHD, and your computer.

- RGB

A color space that represents color using the colors red, green, and blue as components.

- SCL

One of a pair of signals used to provide timing information and requests to transmit/receive for one or more devices to communicate across a common medium.

- SDA

Serial data signal. One of a pair of signals used to provide timing information and requests to transmit/receive for one or more devices to communicate across a common medium. Refer to the I²C standard for more information.

- **SDI**

Serial Digital Interface. A standard for digital video transmission over a coaxial cable.

- **Standard-definition (SD) resolution**

A resolution typically offering up to 1280 x 720 (720p60) pixel resolution.

- **Ultra-high definition (UHD) resolution**

A resolution typically offering up to 3840 × 2160 (2160p) pixel resolution.

- **Vertical synchronization signal**

The part of a video signal that indicates the end of a frame and the start of a new one.

See also *Horizontal synchronization signal*.

- **Y/C**

Luminance/Chrominance. A component video encoding composed of a luminance signal (Y) and a chrominance signal (C). The Y signal provides brightness and contrast. The C signal provides hue information.

- **YCbCr**

A color space used to represent digital component video. YCbCr represents color as brightness and two color difference signals. The Y is the brightness (luma), Cb is the blue minus luma (B-Y), and Cr is the red minus luma (R-Y).

- **YPbPr**

Analog counterpart of YCbCr.

- **YUV**

A color space that represents color using luminance (Y component), the U and V are the chrominance (U and V components).

Appendix B:

Technical

information

This appendix contains information that is useful when installing your Zebra Clarity UHD board.

Board summary



Global information

- Operating system: See software manual for supported versions of Microsoft Windows.
- Minimum computer requirements:
 - x8 PCIe slot.
 - Processor with an Intel 64-bit architecture, or equivalent.
 - A relatively up-to-date PCIe chipset.
 - A case with an expansion slot that respects the current dimensions of the PCI Express Card Electromechanical Specification Revision 3.0: Standard Height Connector Opening in Chassis.
 - A proper power supply. Refer to the *Electrical specifications* section later in this appendix.

Zebra does not guarantee compatibility with all computers that have the above specifications. Please consult with your local Zebra representative, local Zebra sales office, the Zebra web site, or the Zebra Customer Support Group at headquarters before using a specific computer.

Technical features of Zebra Clarity UHD

- Allows you to acquire data simultaneously from up to 8 video sources at up to 8 Gbytes/sec (8192 Mbytes/sec) combined bandwidth to acquisition memory, or 4 Gbytes/sec (4096 Mbytes/sec) to the Host, from 10 connectors.
- The following lists the types of supported video inputs and their associated video formats:
 - Up to 2 standard definition analog video sources with support for resolutions of up to 1920x1200p60 or 1080i60 in RGB, CVBS, Y/C, and YPbPr formats. Note that this type of video input can only come from the analog video connectors.
 - Up to 8 high-definition digital video sources with support for resolutions of up to 1080p60 or 1080i60 in RGB or YUV. Note that this type of video input can only come from the mHDMI, mDP, or SDI connectors.
 - Up to 2 ultra-high definition digital video sources with support for resolutions of up to 2160p60 in RGB or YUV. Note that this type of video input can only come from the mHDMI (that support HDMI ver 2.0), mDP, or SDI connectors.
- When grabbing from an SDI source into a monochrome 8-bit buffer or a YUV16 or BGR32 packed buffer, Zebra Clarity UHD automatically converts the incoming video; it selects the proper color space equations depending on the input resolution (ITU-R BT.601 for SD, ITU-R BT.709 for HD and ITU-R BT.2020 for UHD). Note that, typically SDI streams are natively in YUV format. When grabbing into a YUV16 packed buffer, the input data is not converted.
- On-board video pre-processing. It supports up to x16 scaling (up and down), deinterlacing operations, and optional H.264 encoding (to and from the Host).
- 4 Gbytes of DDR3 SDRAM.

Electrical specifications

The following table describes the Zebra Clarity UHD board’s electrical specifications.

Zebra Clarity UHD						
Idle operating voltage and current			Typical 3.3 V, W: 0.73 A: 0.22			
			Typical 12.0 V, W: 25.44 A: 2.12			
Grabbing and/or H.264 encoding			12 V rail		3.3 V rail	
			Current	Power	Current	Power
	Idle, no populated inputs		2.12	25.44	0.22	0.73
	Idle, all inputs populated		2.60	31.44	0.44	1.45
	Grabbing from all inputs		3.62	43.44	0.46	1.52
	Grabbing from all inputs, using H.264 encoding		3.90	46.80	0.46	1.52
	No grabbing, H.264 encoding Host images		2.52	30.24	0.22	0.73
	Grabbing from SDI		3.03	36.36	0.46	1.52
	Grabbing from mDP		2.83	33.96	0.22	0.73
	Grabbing from mHDMI (HDMI 2.0)		3.09	37.08	0.22	0.73
	Grabbing from analog		2.87	34.44	0.22	0.73

❖ Note that, when measuring power consumption, the maximal resolution was used for each source. All values in this table are rounded, using scientific rounding, to the nearest hundredth.

Dimensions and environmental specifications

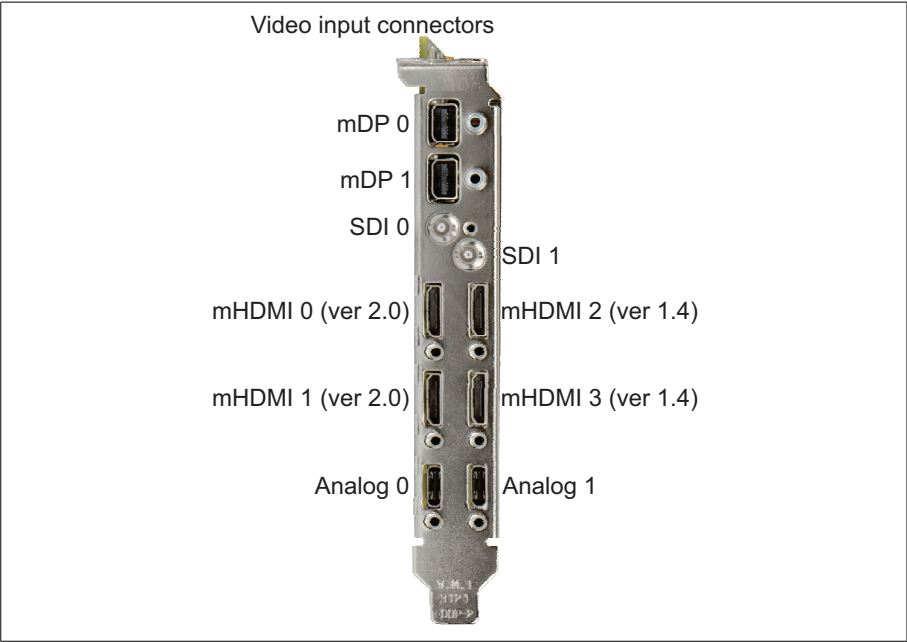
Zebra Clarity UHD has the following dimensions:

- Dimensions: 212.73 mm x 111.28 mm x 18.0 mm (8.38 in x 4.38 in x 0.71 in) from bottom edge of goldfinger to top edge of board.
- Minimum/maximum ambient operating temperature: 0 °C to 55 °C (32°F to 131°F) with a minimum airflow between 150 and 200 linear ft/min (LFM).
- Minimum/maximum storage temperature: -40°C to 75°C (-40°F to 167°F).
- Operating relative humidity: up to 95% relative humidity (non-condensing).
- Storage humidity: up to 95% relative humidity (non-condensing).

Video input connectors on Zebra Clarity UHD boards

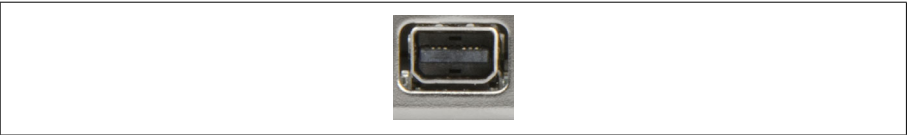
The Zebra Clarity UHD board has ten video input connectors on its bracket. There are four mini-HDMI (mHDMI) video input connectors, two SDI video input connectors, two mini-DisplayPort (mDP) video input connectors, and two analog video input connectors (for receiving analog video).

The following image shows the Zebra Clarity UHD’s bracket.



DisplayPort (mDP) video input connectors

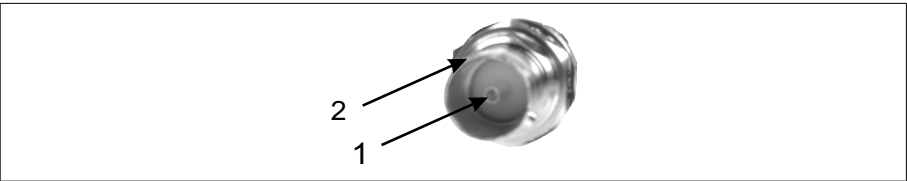
Each of the two DisplayPort (mDP) video input connectors is a rectangular, mini 20-pin female connectors, running at up to 5.4 Gbits/sec. The mDP video input connectors are compatible with version 1.2 of the DisplayPort specification. Note that this specification is backwards-compatible.



The pinout of this standard connector follows the Video Electronics Standards Association (VESA) specification for an mDP 1.2 upstream port connector of a downstream device (such as, a sinking device). The upstream port connects to your camera (an upstream device that provides the data), while your Zebra Clarity UHD is considered a downstream (or receiving) device.

SDI video input connector

There are two SDI video input connectors on the Zebra Clarity UHD board. Each SDI video input connector is an HD-BNC connector (micro-BNC), designed to receive SD/HD/UHD video, up to 12G (2160p60).



The pin assignment for each SDI video input connector is as follows

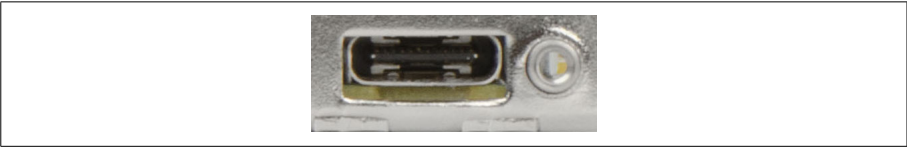
Pin	Signal	Description
1	DATA_SDI_IN	High definition or standard definition serial digital video input.
2 (SHELL)	GND	Ground.

High quality cables (rated for 12G SDI video input) are required for the best results when using a 12G video data signal. Follow the recommendations of your cable manufacturer regarding data fidelity, over distance based on the type of video data being transmitted.

The SDI video input connectors on your Zebra Clarity UHD are too close together on the faceplate of the board for you to connect two large diameter cables (such as, two 1694a Belden cables). Instead, either two smaller diameter cables (such as, two RG59 Belden cables), or a shorter smaller-diameter cable with HD-BNC-to-BNC connectors could be used to connect a longer cable to the board’s SDI video input connectors.

Analog video input connectors

Each of the two analog video input connectors is a rectangular, series “C”, 24-pin double-sided connectors. These connectors are used to receive only analog video. In addition, these connectors are polarized with a screw (depicted), and as such, the cable is not reversible.



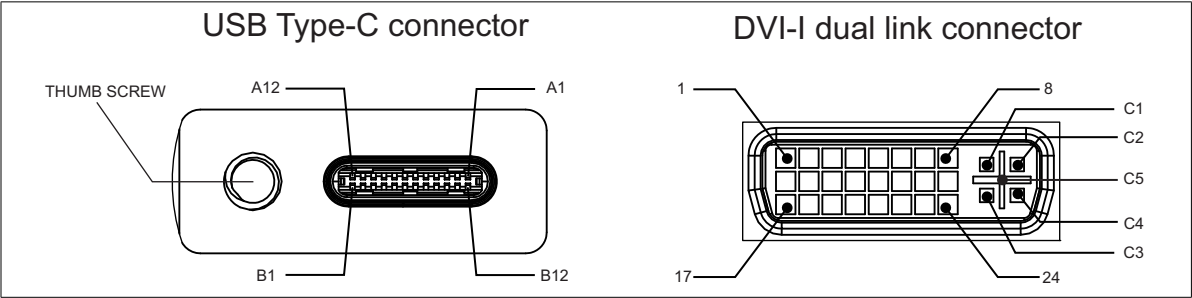
Important

- ❖ Note that the pinout of this connector is not compatible with a typical USB Type-C 3.0 connector (either used for data, charging devices, or for data to video conversion). Connecting any device other than an analog video source to the analog video input connector might damage the board.

The mHDMI connectors that support HDMI 1.4 share the same acquisition paths as the analog video input connectors.

If you use	You cannot use
Analog video input connector 0	mHDMI video input connector 2
Analog video input connector 1	mHDMI video input connector 3

The pin assignment for each analog video input connector and the associated DVI-I connector on its adapter cable is as follows:



USB Type-C analog connector	Signal Name	DVI-I Dual Link analog connector	Signal description
A1, A12, B1, B12	GND	15	Ground.
A2	VID_IN3	C3	Analog blue video input (the C component of the Y/C video input).
A3	CSYNC	5	Composite synchronization signal.
A4, B9, B4,A9	PWR	14	Power (+5 V).
A5	SDA	7	Serial data analog signal.
A6, A7, B7, B6, B5	NC	23,24	Not connected.
A8	VSYNC	14	Vertical synchronization.
A10	VID_IN6	12	Luminance video input.
A11	SCL	6	Serial clock data.
B11	VID_IN1	C1	Analog red video input.
B10	VID_IN2	C2	Analog green video input. (the Y component of the Y/C video input)
B8	HSYNC	C4	Horizontal synchronization.
B3	VID_IN4	4	CVBS video input.
B2	VID_IN5	20	Chrominance video input.

An analog-video-input-to-DVI-I adapter cable is available for purchase from Zebra. Contact your Zebra representative for more information:

	Cable information
Manufacture	Zebra Technologies Corporation.
Part number:	CLA-CBL-USBDVI
Description:	Two (2) USB Type-C to DVI analog cable adapters for Zebra Clarity UHD.

Mini-HDMI (mHDMI) video input connectors

There are four mini-HDMI (type C) video input connectors.



- ❖ Note that connectors 0 and 1 support HDMI 2.0, while connectors 2 and 3, support HDMI 1.4.

The mHDMI connectors that support HDMI 1.4 share the same acquisition paths as the analog video input connectors.

If you use	You cannot use
Analog video input connector 0	mHDMI video input connector 2
Analog video input connector 1	mHDMI video input connector 3

The pinout of this standard connector follows the HDMI specification.

