

## Introduction (Ask a Question)

CoaXPress, an interface predominantly utilized for connecting devices, especially cameras, to hosts such as frame grabbers, is a key component in this demonstration. It comprises a master connection and optional extension connections that collectively form a link. In the CoaXPress v2.0 protocol, each connection supports a data rate of up to 12.5 Gbps.

The technical demonstration of the PolarFire® CoaXPress Video operates seamlessly with the PolarFire video kit, CoaXPress FMC host, Dual camera sensor module, CoaXPress FMC device, and an HDMI monitor. This document serves as a comprehensive guide to facilitate the execution of the demo. The design of the demo represents a fully integrated solution crafted using Microchip's Libero® SoC Design Suite.

The implementation incorporates GenICam technology, providing a unified API and GUI for exposing various camera features. Each feature is abstractly defined, encompassing its name, interface type, unit of measurement, and behavior. The GenICam standard prescribes the methodology for creating a camera XML description file that delineates the device's features.

This technical document introduces the PolarFire CoaXPress Video demo, demonstrating seamless integration with the PolarFire video kit and providing detailed instructions. The demo showcases the following functions:

1. Provides CoaXPress communication adherent to CoaXPress standards 1.0, 1.1, and 2.0
2. Supports 4K input over Mobile Industry Processor Interface (MIPI) Camera Serial Interface (CSI-2) and output over HDMI 2.0
3. Provides GenICam-enabled camera control
4. Supports Conversion of Color Filter Array (CFA) to Red, Green, Blue (RGB)
5. Supports Image enhancement via Image Signal Processor (ISP)



**Important:** For more information, see [PolarFire FPGA Video and Imaging Kit with MPF300T Device \(MPF300-VIDEO-KIT-NS\)](#), [Smart Embedded Vision](#), and [CoaXPress FMC Daughter Card \(VIDEO-DC-CXP\)](#).

## Unsupported Features

The following features are not supported:

- Multi Channel Support is not supported

## Interoperability

CXP device is tested for single channel transmit and receive with third party frame grabbers like [Matrox](#), [Euresys](#), [BitFlow](#), and [HIK](#).

CXP host is tested for single channel transmit and receive with third party CXP device camera like [Basler](#).

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## 1. Demo Requirements [\(Ask a Question\)](#)

The following table lists the hardware and software required for running the demo.

**Table 1-1.** Demo Requirements

Requirement	Description
<b>Hardware and Accessories</b>	
PolarFire® video kit	<a href="#">MPF300-VIDEO-KIT-NS</a> Kit Contents: <ul style="list-style-type: none"> <li>• PolarFire Video and Imaging board with MPF300T-1FCG1152E Device</li> <li>• Dual Camera Sensor board – VIDEO-DC-DUALCAM</li> <li>• HDMI cable</li> <li>• 12V power pack/AC adapter</li> <li>• USB 2.0 A male to mini-B</li> </ul>
CoaXPress FMC	<a href="#">VIDEO-DC-CXP</a> Board Contents: <ul style="list-style-type: none"> <li>• CoaXPress device board with PolarFire FPGA with 100K LE MPF100T-1FCSG325I</li> <li>• CoaXPress host board</li> <li>• FLASHPRO4</li> <li>• Coaxial HD-BNC to HD BNC male-to-male cable</li> <li>• USB 2.0 A male to mini-B</li> </ul>
HDMI monitor	1920 × 1080, 60 Hz or 4K 60 Hz resolution monitor for the HDMI 2.0 transmitter (Tx) port
Host PC	A host PC with USB port
<b>Utility Software</b>	
Program_Debug_v23.2_win.exe	This executable file installs FlashPro Express, used to program the FPGA

## 2. Demo Prerequisites [\(Ask a Question\)](#)

Before you start the demo, ensure that the following listed components are installed:

1. Download the [PolarFire CoaXPress video demo design files](#).
2. Extract the contents of the .zip archive on the host PC.
3. Extract the programming job file from the mpf\_an5021\_v2023p2\_liberosoc\_jb folder available in the design file.
4. Install the application from the mpf\_an5021\_v2023p2\_liberosoc\_gui folder available in the design file.
5. Download and install the ProgramDebug\_v23.2\_win.exe binary file from the [Program and Debug Software](#) page.



**Important:** The Program and Debug software also installs the drivers on the host PC to detect the COM port for running the demo. Install this software whenever the demo is run on a different host PC.

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The executable installs FlashPro Express and SmartDebug used for FPGA programming and debugging on the host PC.

### 3. Installing the Demo GUI [\(Ask a Question\)](#)

To install the GUI, perform the following steps:

1. Extract the contents of the `mpf_an5021_v2023p2_liberosoc_gui.zip` file and run the `setup.exe` file.
2. Click **Yes** for any message from User Account Control. The CoaXPress - GenICam GUI installation window is displayed.
3. Confirm the installation directory locations for the GUI and the National Instruments products and click **Next**.
4. Accept the license agreement, and click **Next**.
5. Review the summary and click **Next**, then installation proceeds with a progress bar. After the installation, a confirmation message is displayed.
6. Click **Next** to exit the installation window.
7. Restart the host PC when prompted. The CoaXPress - GenICam GUI is installed.

## 4. Setting up the Demo [\(Ask a Question\)](#)

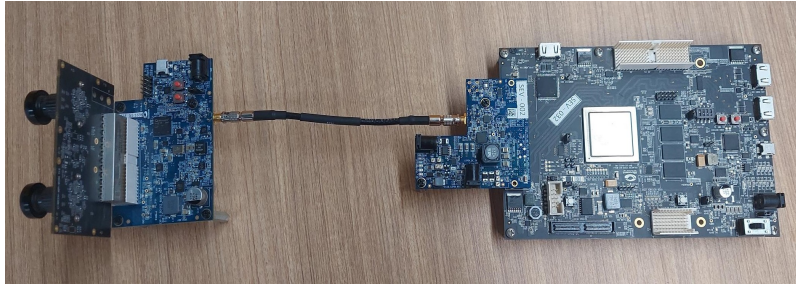
The demonstration involves the following steps:

1. Setting up the Hardware
2. Programming the FPGA Device

### 4.1 Setting up the Hardware [\(Ask a Question\)](#)

The following figure shows the hardware setup.

**Figure 4-1.** Setting up the Hardware



For setting up the hardware, perform the following steps:

1. Connect the camera sensor module with the CoaXPress FMC (device) board. This side is called the CXP device side.
2. Connect the CoaXPress FMC (host) board with the PolarFire video kit through FMC connector. This side is called the CXP host side.
3. Connect the CXP device side and host side.
4. Connect the J1 connector of the dual camera sensor module to J1 connector of the CoaXPress FMC (device) board.
5. Connect the J11 (FMC) connector of the CoaXPress FMC (host) board to J14 (FMC) connector of the PolarFire video kit.
6. Connect the CoaXPress FMC (device) board and the CoaXPress FMC (host) board using the Coaxial HD-BNC to HD-BNC Male to Male cable.
7. Connect the HDMI monitor to J1 (HDMI 2.0 transmitter (Tx) port) of the PolarFire video kit using the HDMI cable.
8. Connect the host PC and the PolarFire video kit through J12 of the PolarFire video kit using the USB mini cable.
9. Connect the FlashPro4 through J21 of CoaXPress FMC (device) board.
10. Connect the power supply cable to J20 of the PolarFire video kit.
11. Ensure that the jumper settings on the PolarFire video kit are same as listed in the following table.

The following table lists the jumper settings of PolarFire video kit.

**Table 4-1.** Jumper and Switch Settings of PolarFire Video Kit

Jumper	Default Position	Description
J15	Open	SPI Slave and Master mode selection By default, select SPI master
J17	Open	100K PD for TRSTn By default, 1K PD is connected
J19	Pin 1 and 2	Default: XCVR_VREF is connected to GND
J28	Pin 1 and 2	Default: Programming through the FTDI
J24	Pin 2 and 4	Default: VDDAUX4 voltage is set to 3.3V
J25	Pin 3 and 4	Bank4 voltage is set to 2.5V
J36	Pin 1 and 2	Default: Board power up through the SW4
SW4	OFF/ON	Power ON/OFF slide switch
SW6	OFF	User slide switch Default position: OFF
J20	12 Volts Input	12V input to the board

12. Ensure that the following listed jumper settings are set on the CoaXPress FMC device and host boards.

The following table lists the jumper settings of CoaXPress FMC host and device boards.

**Table 4-2.** Jumper Settings of CoaXPress FMC Host and Device Board

Board Name	Jumper	Pins
CoaXPress FMC host board	J20	Closed Pin 2 and 3
	J19	Open Pin 2 and 3
	J14	Open Pin 2 and 3
CoaXPress FMC device board	J7	If Pin 1 and 2 are closed, connect an external power supply of 24V. If Pin 2 and 3 are closed, the device sources its power from the host through the CoaXPress cable. Ensure that the CoaXPress host is equipped with an external power supply.

13. Turn on the HDMI monitor.

14. Turn on the board using the SW4 slide switch.

The PolarFire dual camera video and imaging hardware is set up.

## 4.2 Programming the FPGA Device [\(Ask a Question\)](#)

This section describes how to program the FPGA device with the job files using Flashpro Express. The job files are available at the following design files folder location:

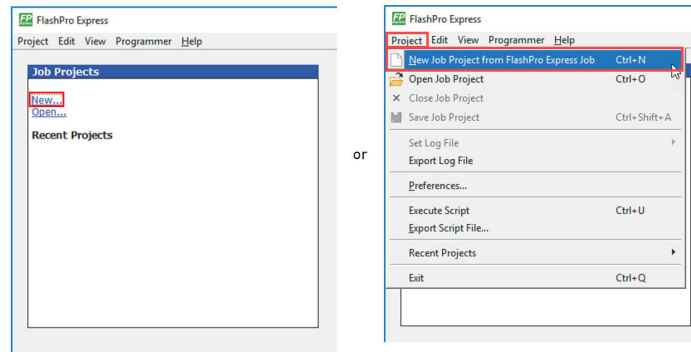
<\${Download\_Directory}>\mpf\_an5021\_v2023p2\_liberosoc\_jb.

### 4.2.1 Programming the FPGA on the CoaXPress FMC Host Board [\(Ask a Question\)](#)

To program the device, perform the following steps:

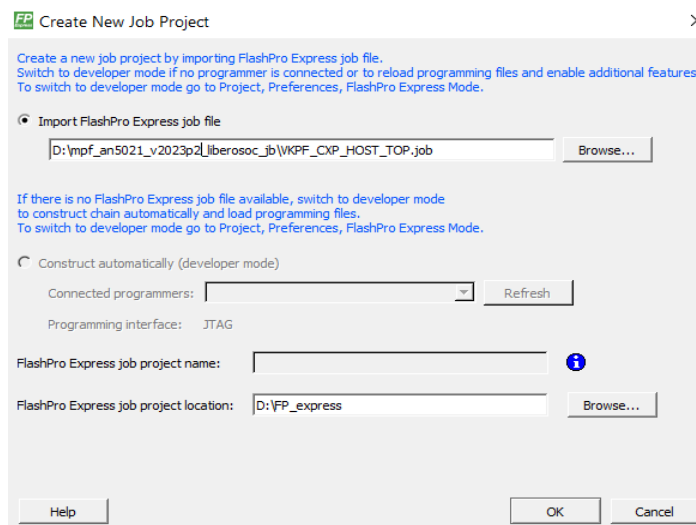
1. On the host PC, start the FlashPro Express software from its installation.
2. Select **New** or **New Job Project** from **Project** menu to create a new job project, as shown in the following figure.

Figure 4-2. FlashPro Express Job Project



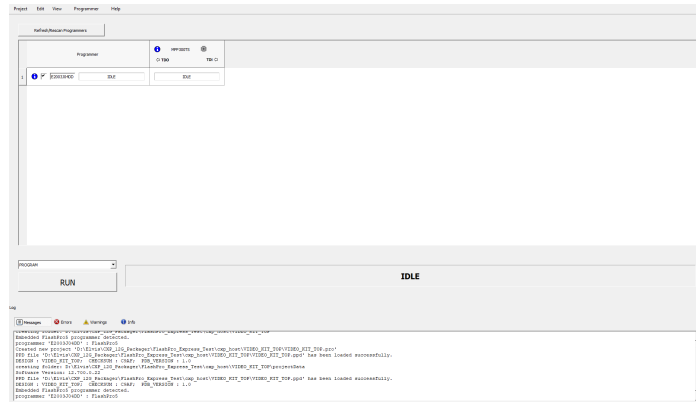
3. In the **Create New Job Project** dialog box, enter the following values in the New Job Project:
  - **Import FlashPro Express job file:** Click **Browse**, and navigate to the location where the .job file is located and select the file. The default location is `<${Download_Directory}>\mpf_an5021_v2023p2_liberosoc_jb\VKPF_CXP_HOST_TOP.job`.
  - **FlashPro Express job project location:** Click **Browse**, and navigate to the location in the local system to save the project.

Figure 4-3. New Job Project from FlashPro Express Job



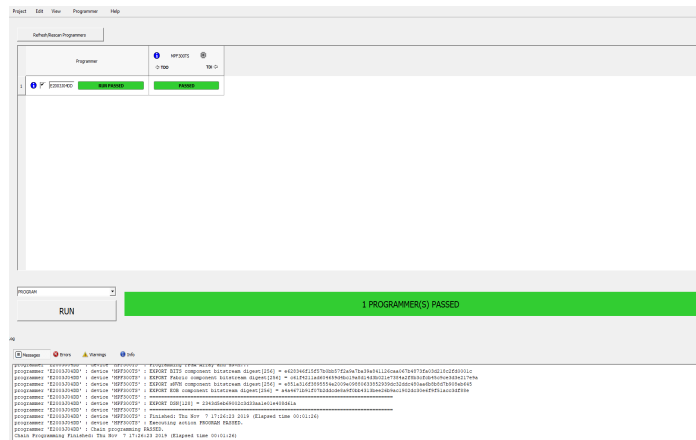
4. Click **OK**. The required programming file is selected and ready to be programmed in the device.
5. Connect the USB 2.0A to the mini cable with J12 of the PolarFire video kit.
6. The FlashPro Express window appears as shown in the following figure. Confirm that a programmer number appears in the Programmer field. If it does not, then confirm the board connections and click **Refresh/Rescan Programmers**.

Figure 4-4. Programming the Device



- Click **RUN** to program the device. When the device is programmed successfully, a **RUN PASSED** status is displayed as shown in the following figure. For more information about how to run the demo, see 5. [Running the Demo](#) section.

Figure 4-5. FlashPro Express—RUN PASSED



- Close **FlashPro Express** or in the Project tab, click **Exit**.

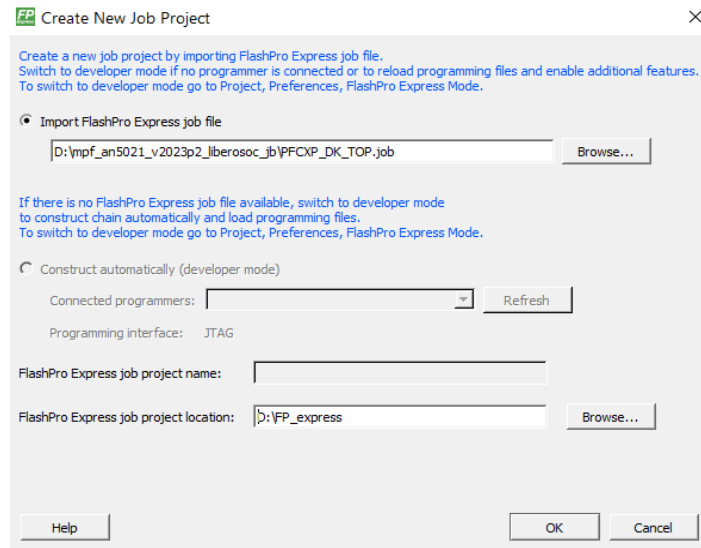
The PolarFire device and SPI Flash on the CXP-host is programmed.

#### 4.2.2 Programming FPGA on the CoaXPRESS FMC Device Board [\(Ask a Question\)](#)

To program the device, perform the following steps:

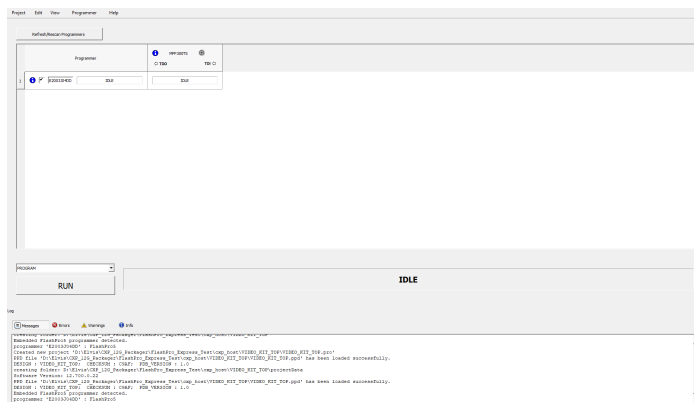
- On the host PC, launch the FlashPro Express software from its installation.
- Select **New** or **New Job Project** from FlashPro Express Job from **Project** menu to create a new job project, as shown in [Figure 4-2](#).
- In the **Create New Job Project** dialog box, enter the following values in the New Job Project:
  - Import FlashPro Express job file:** Click **Browse**, and navigate to the location where the job file is located and select the file. The default location is `<$Download_Directory>\mpf_an5021_v2023p2_liberosoc_jb\PFCXP_DK_TOP.job`.
  - FlashPro Express job project location:** Click **Browse**, and navigate to the location in the local system to save the project.

**Figure 4-6.** New Job Project from FlashPro Express Job



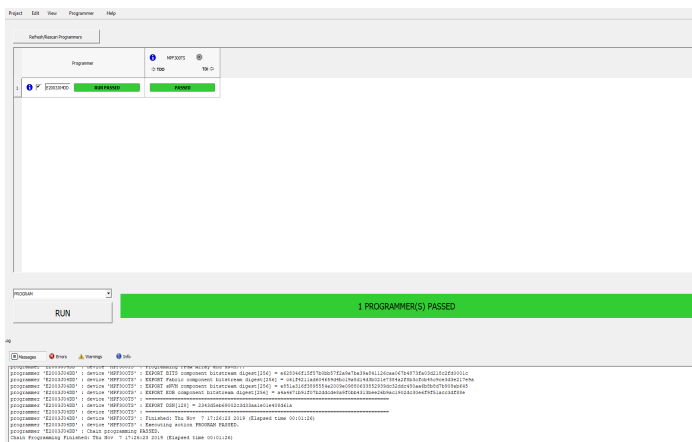
4. Click **OK**. The required programming file is selected and ready to be programmed in the device.
5. Disconnect the mini USB cable from J12 of the PolarFire video kit and connect the mini USB cable to FlashPro4.
6. Connect FlashPro4 with J21 (JTAG) of the CoaXPress FMC device board.
7. The FlashPro Express window appears as shown in the following figure. Confirm that a programmer number appears in the Programmer field. If it does not, confirm the board connections and click **Refresh/Rescan Programmers**.

**Figure 4-7.** Programming the device



8. Click **RUN**. When the device is programmed successfully, a **RUN PASSED** status is displayed as shown in the following figure. For more information about how to run the demo, see [5. Running the Demo](#) section.

Figure 4-8. FlashPro Express—RUN PASSED



9. Close **FlashPro Express** or in the Project tab, click **Exit**.

The PolarFire device and SPI Flash on the CXP-device is programmed. Now, both host and device are programmed. Power cycle the board using switch SW4. After power cycling, the Full HD HDMI monitor displays the default colour screen.

## 5. Running the Demo [\(Ask a Question\)](#)

The demo features receiving the Mobile Industry Processor Interface (MIPI) Rx data from the one camera with 4K resolution at 30 frames per second (fps). The 4K MIPI video data from the one camera is converted to CoaXPRESS data using the CoaXPRESS IP and transmitted via the coaxial cable. The CoaXPRESS data received from the host board is converted into video data using the CoaXPRESS IP. The received video frames from CoaXPRESS are stored in DDR and passed on to the display as per the display controller timing parameters. The image processing IPs are enabled on the display side of the video pipeline.

In the demo design, display controller is used to provide the Full HD output (1920 × 1080 60 Hz resolution) or 4K (3840 × 2160 60 Hz) output based on the DIP sw1 position when the PolarFire® video kit is turned ON. The output supports image enhancements such as contrast, brightness, and color balance. The display controller settings are listed in the following table.

**Table 5-1.** Display Controller Settings

Selected Display	DIP SW1 Position
Full HD	OFF
4K	ON

Running the demo involves adjusting the imaging and video settings using the **CoaXPRESS - GenICam GUI**, and then observe the result on the HDMI monitor.

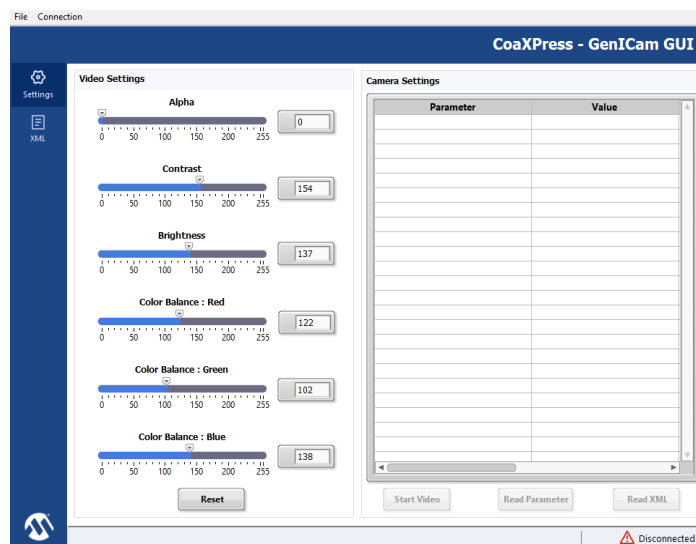


**Important:** Make sure that both host and device powered on, connected with Coax Cable, and wait till streaming is started. If default streaming is not started, try power cycling both host and device.

To use the demo GUI, perform the following steps:

1. Launch the **CoaXPRESS - GenICam GUI** from the **Program** menu. The GUI is displayed, as shown in the following figure.

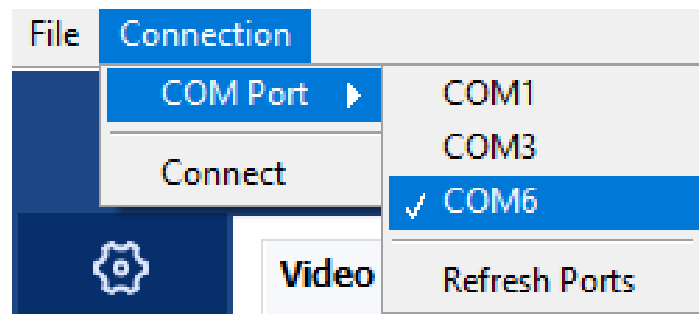
**Figure 5-1.** CoaXPRESS - GenICam GUI



2. To connect the COM Port, perform the following steps:
  - a. Select **Connection**, from the menu bar in the GUI.

- b. Select **COM Port**, and select the second largest com port from the list.
- c. Click **Connect** option, which is beneath the **COM Port** option as shown in the following figure.

Figure 5-2. COM Port Connection



- d. **Disconnect** option appears indicating a successful connection, as shown in the following figure.

Figure 5-3. COM Port Disconnection Option



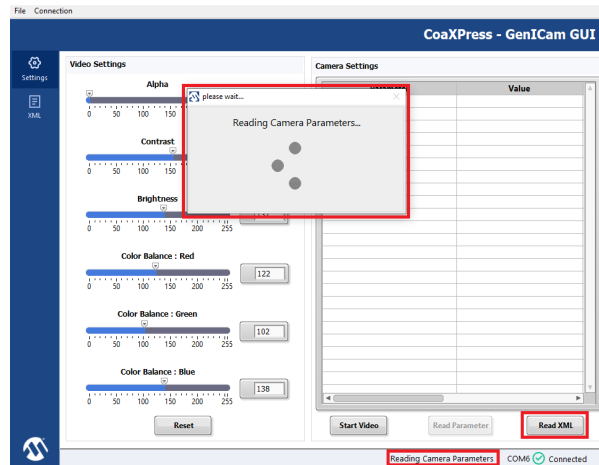
- e. COMX and Connected appears with the green tick mark at the bottom of the GUI, as shown in the following figure.

Figure 5-4. Connection—Successful



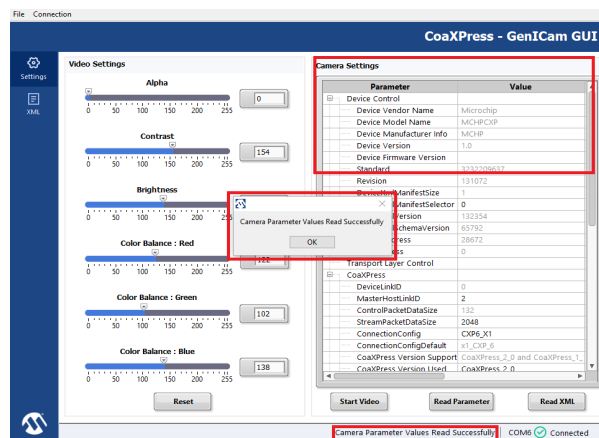
- 3. After successful com port connection, click **Read XML** button which is at the bottom of the GUI. Host starts reading XML from Device, displaying **Reading Camera Parameters** at the bottom of the GUI and a pop-up window with wait symbol appears, as shown in the following figure.

Figure 5-5. Reading Camera Parameters



4. After successful reading of XML, a pop-up window **Camera Parameter Values Read Successfully** appears, which will be displayed at the bottom of the GUI. Click **OK**. Camera Tree structure will be displayed, as shown in the following figure.

Figure 5-6. Camera Read Parameters—Successful



5. Alpha values changes with **StreamIDSelect** and ensure to set the values listed, as shown in the following figure.
  - a. Set to 0 for Stream 0 - default (One of the two cameras will do streaming)
  - b. Set to 255 for Stream 1 (One of the two cameras will do streaming)
  - c. Set to 128 for both streams, please change the **ConnectionConfig** to **CXP12\_X1** when it appears, then proceed by clicking **OK**. Subsequently, adjust the rate to 12 G. (Two cameras will do streaming)

Figure 5-7. Adjusting Alpha for Stream 0

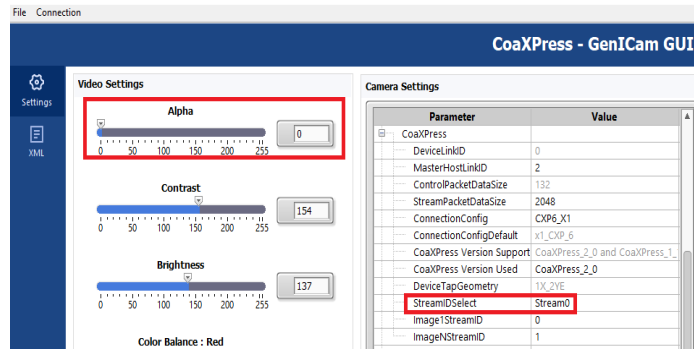


Figure 5-8. Adjusting Alpha for Stream 1

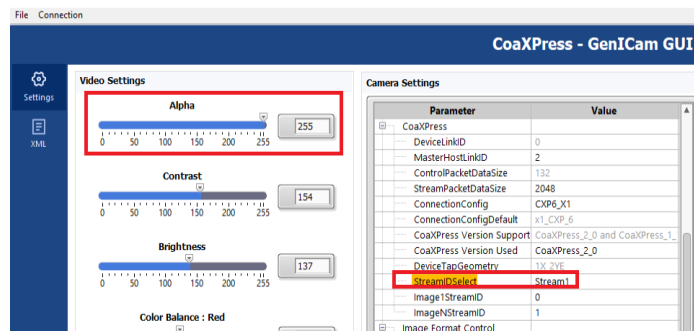
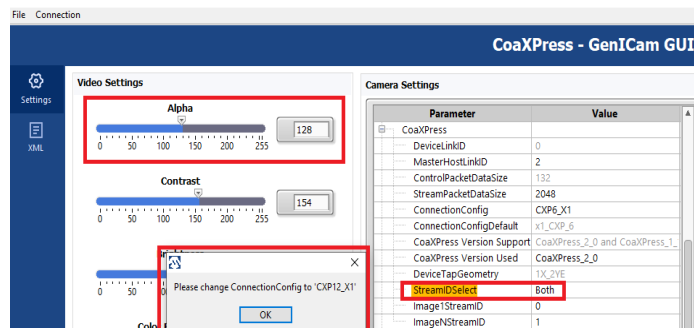
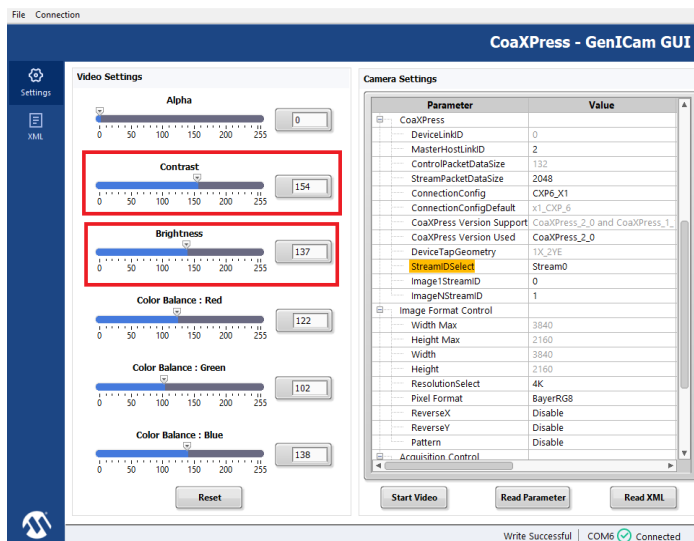


Figure 5-9. Adjusting Alpha for Both Streams



- Use the **Contrast** and **Brightness** sliders to adjust the contrast and brightness and observe the changes on the HDMI monitor. The sliders are highlighted in the following figure.

Figure 5-10. Adjusting Contrast and Brightness



7. Similarly, adjust the color balance of the image using the **Color Balance** sliders.



#### Important:

- Default image settings are reverted by using the **Reset** option.
- Press **Read XML** option for refreshing Camera XML tree.

## 6. GenICam GUI Features [\(Ask a Question\)](#)

This allows to send various GenICam commands from the host to the device. The selection is made from the **Camera Settings Tree**.

To select the GenICam GUI features, perform the following steps:

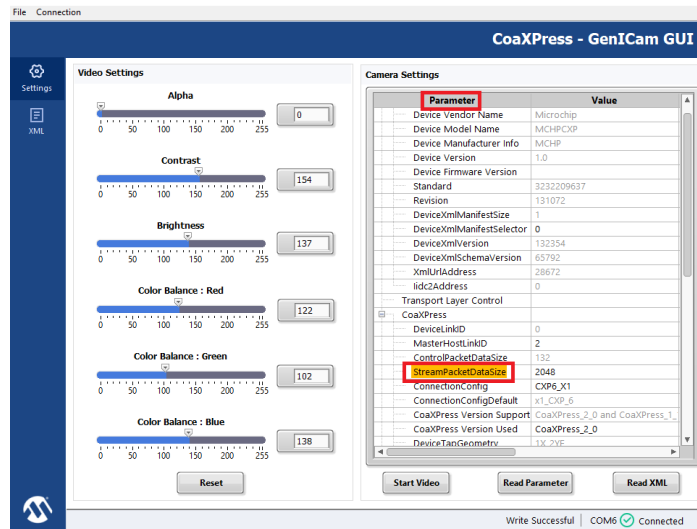
1. In **Parameter** tab, select the command that needs to be updated.



### Important:

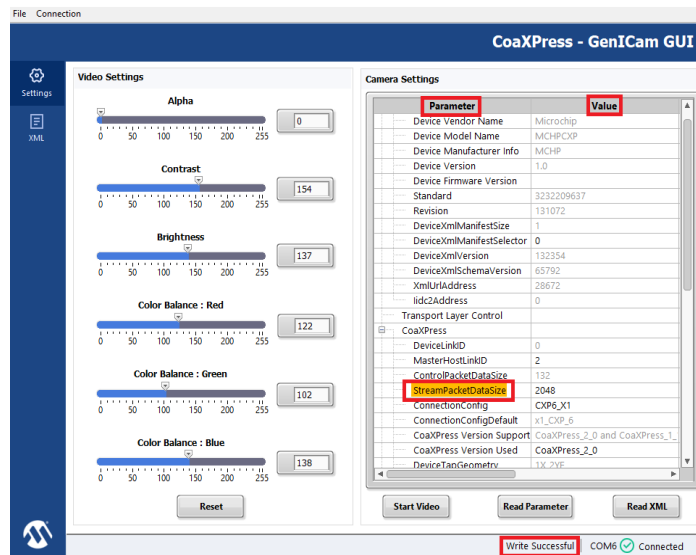
- Make sure streaming is stopped by clicking **Stop Video** button at the bottom of the GUI. Ignore this step if already the streaming is stopped. This step should be done prior to try any of the GenICam GUI features.
- All the features are applicable for both **Stream 0** and **Stream 1**. Any of the stream Id can be selected.
- Double-click **Value** tab to enter the number or selecting Enum option.

Figure 6-1. GenICam Commands Tab



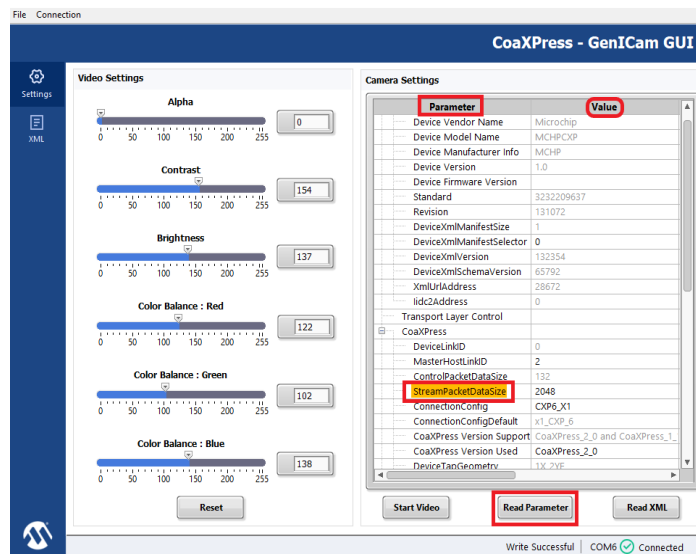
2. In **Value** tab, the parameters are read or write from the device. **Write** variables are highlighted. If it is **Write** variable, double-click and enter the value or select the option from enum menu.
3. **Write Successful** will appear at the bottom of the GUI as shown in the following figure.

Figure 6-2. Write Parameter



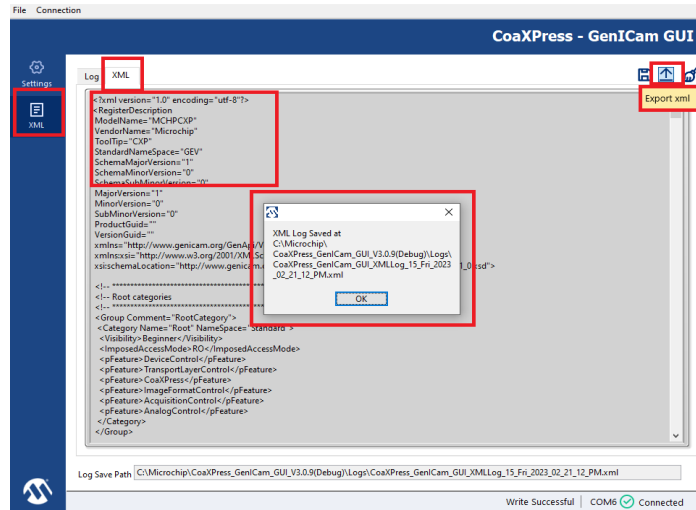
- If it is **Read** variable, the value is read by using **Read Parameter** button as shown in the following figure.

Figure 6-3. Read Parameter



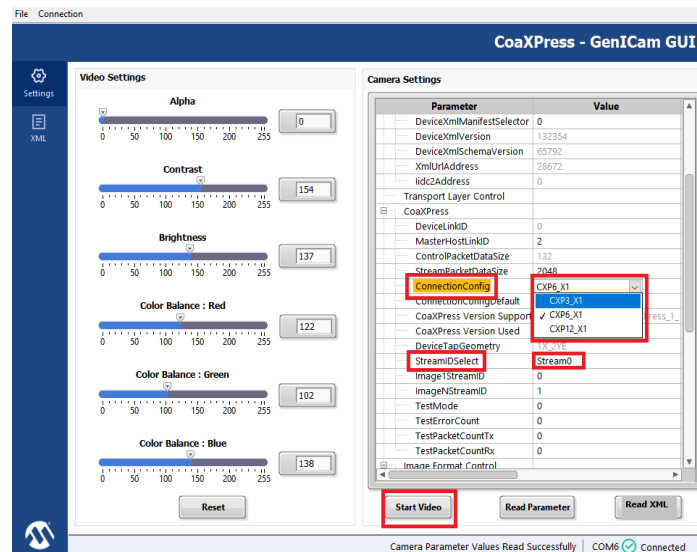
- Start Video** button at the bottom of the GUI starts the Video streaming of the stream depending on the stream selected in **StreamIDSelect**.
- Streaming must be stopped by using the **Stop Video** tab.
- Read XML** command again reads the zipped xml file from device memory and displays unzipped xml in XML tab, also **Camera Settings** tree window is updated.
- Click **Export XML** to save the last received xml file on the host PC as shown in the following figure.

Figure 6-4. Export XML



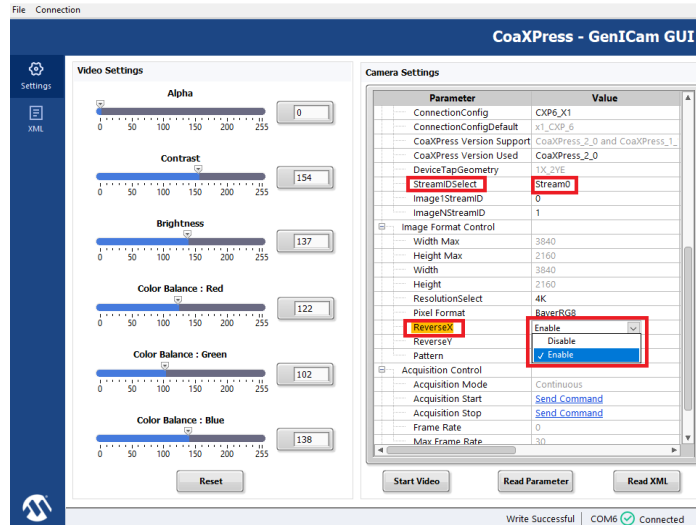
9. Both CoaXPress FMC host And device supports rate change by selecting **Connection Config** in **CoaXPress** menu. Total six rates starting from 1.25 G to 12.5 G are supported. In the GUI 3.25 G, 6.0 G, 12.5 G rates are supported. To change the rate, perform the following steps:
  - a. Make sure streaming is stopped by clicking **Stop Video** button at the bottom of the GUI. Ignore this step if already the streaming is stopped.
  - b. Select Parameter **StreamIDSelect** and select **Stream 0**.
  - c. Select Parameter **Connection Config**, and then double-click Enum options in **Value** tab.
  - d. Select Enum option **CXP3\_X1** to change rate to 3.25 G.
  - e. Same steps are applied to change rate from 3.25 G to 6.0 G or 6.0G to 12.5 G or 12.5 G to 6.0 G as shown in the following figure.

Figure 6-5. Rate changing



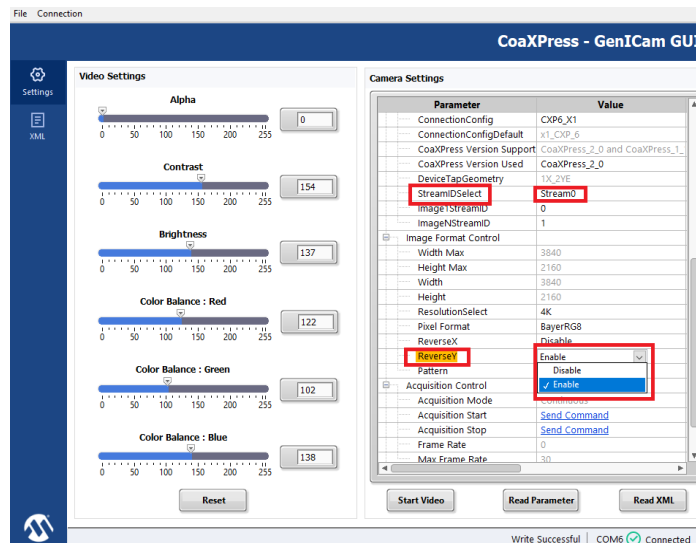
- f. After following preceding steps, press **Start Video** button for streaming.
10. Camera module on device supports flipping the video capture horizontally and is performed by selecting **ReverseX** in **Image Format Control** Group as shown in the following figure.

Figure 6-6. Selecting ReverseX for Horizontal Video Capture



- a. Ensure that streaming is stopped by clicking **Stop Video**.
  - b. Select Parameter **StreamIDSelect**, and then select **Stream 0**.
  - c. Select Parameter **ReverseX**, and then click Enum option **Enable** in **Value** tab and press **Enter**.
  - d. Press **Start Video** button for streaming.
  - e. Press **Stop Video**, and then Select Enum option **Disable** to come back to normal mode.
11. Camera module on device supports flipping the video capture vertically and is performed by selecting **ReverseY** in **Image Format Control** Group as shown in the following figure.

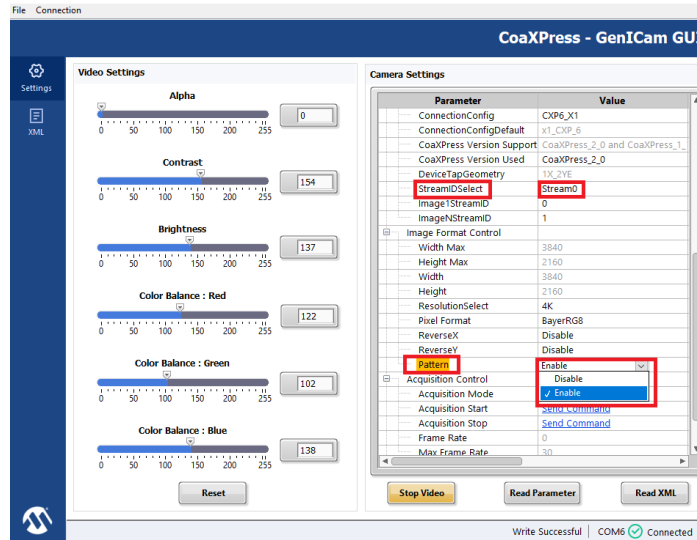
Figure 6-7. Selecting ReverseY for Vertical Video Capture



- a. Ensure that streaming is stopped by clicking **Stop Video**.
- b. Select Parameter **StreamIDSelect**, and then select **Stream 0**.
- c. Select Parameter **ReverseY**, and then click Enum option **Enable** in **Value** tab and press **Enter**.

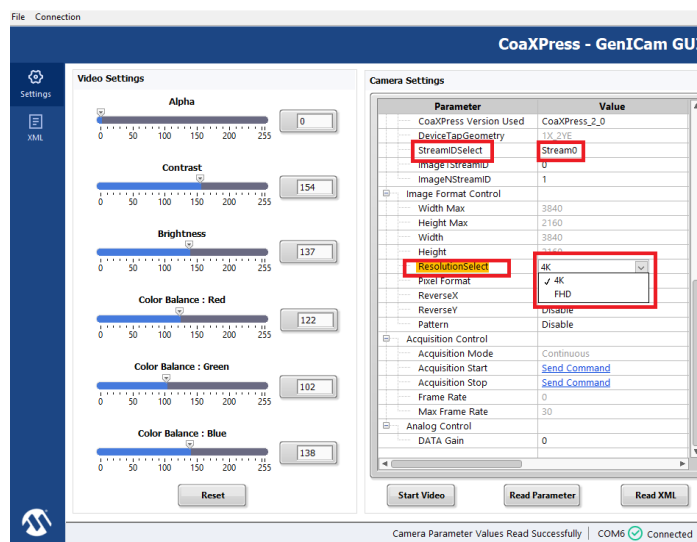
- d. Press **Start Video** button for streaming.
  - e. Press **Stop Video**, and then Select Enum option **Disable** to come back to normal mode.
12. Camera module on device supports sending Pattern and is performed by selecting **Pattern** in **Image Format Control** Group as shown in the following figure.

Figure 6-8. Selecting Pattern



- a. Ensure that streaming is stopped by clicking **Stop Video**.
  - b. Select Parameter **StreamIDSelect**, and then select **Stream 0**.
  - c. Select Parameter **Pattern**, and then click Enum option **Enable** in **Value** tab.
  - d. Press **Start Video** button for streaming.
  - e. Press **Stop Video**, and then Select Enum option **Disable** to come back to normal mode.
13. Camera module on device supports Resolution 4K and Full HD, and is performed by selecting **ResolutionSelect** in **Image Format Control** Group, as shown in the following figure.

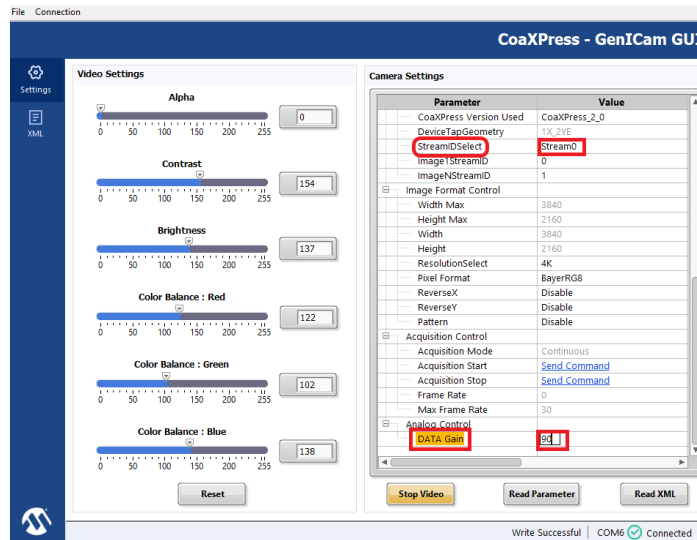
Figure 6-9. Selecting Resolution



- a. Ensure that streaming is stopped by clicking **Stop Video**.

- b. Select Parameter **StreamIDSelect**, and then select **Stream 0**.
  - c. Select Parameter **ResolutionSelect** and select 4K or FHD and press **Enter**.
  - d. Press **Start Video** button for streaming.
14. Camera module on device supports Gain update and is performed by selecting **DATA Gain** in **Analog Control** Group, as shown in the following figure.

Figure 6-10. Gain Update Option



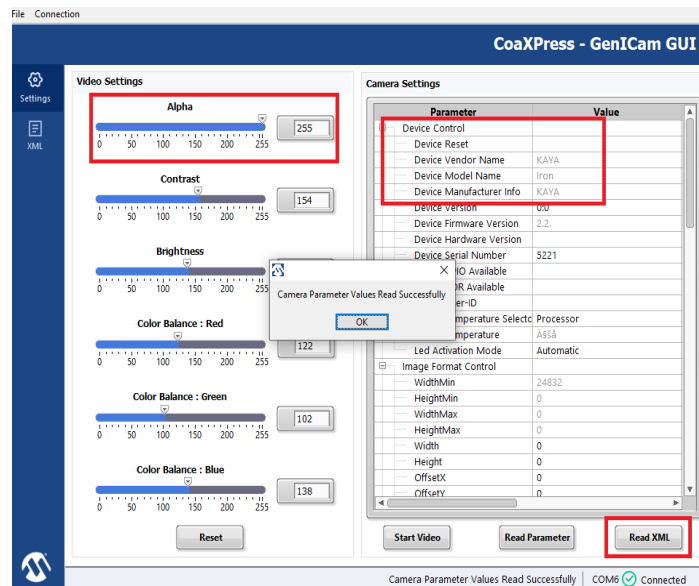
- a. Select Parameter **StreamIDSelect** and select **Stream 0**.
  - b. Select Parameter **DATA Gain**, and then enter the value from 0 to 100 in **Value** tab.
15. Close the GUI to exit from the demo.
- For information about testing the CoaXPress FMC host, see [7. Testing of CoaXPress FMC Host with Basler Camera](#) section.

## 7. Testing of CoaXPress FMC Host with Basler Camera [\(Ask a Question\)](#)

To do CoaXPress FMC host testing with Basler camera, perform the following steps:

1. Connect Basler camera to CoaXPress FMC host through Coax cable.
2. Basler camera starts continuously blinking a green light. By default, the Basler camera streams Stream1.
3. To see the video display on monitor, in the **CoaXPress - GenICam GUI Video Settings**, set **Alpha** to **255**, as shown in the following figure.

**Figure 7-1.** Using Basler Camera



4. To read XML, click **Read XML**.

## 8. Appendix A: Running the Tcl Script [\(Ask a Question\)](#)

Tcl scripts (`mpf_an5021_v2023p2_liberosoc_df.zip`) are provided for CoaXPress device and host designs.

To run Tcl, perform the following steps:

1. Launch the Libero software.
2. Select **Project > Execute Script**.
3. Click **Browse** and select `Device/MPF_CXP_DK_DESIGN.tcl` from the downloaded `TCL_Scripts` directory to generate Libero design for CoaXPress device.
4. Click **Browse** and select `Host/MPF_VK_CXP_HOST_DESIGN.tcl` from the downloaded `TCL_Scripts` directory to generate Libero design for CoaXPress host.
5. Add any required arguments (for example, **VERIFY\_TIMING\_EXPORT\_FPE**).
6. Click **Run**.

After successful execution of the Tcl script, the Libero project is created within the top directory.

For more information about Tcl scripts and commands, see `readme.txt` file and [Tcl Commands Reference Guide](#). Contact Technical Support for any queries about running the Tcl script.

## 9. Revision History [\(Ask a Question\)](#)

The revision history describes the changes that were implemented in the document. The changes are listed by revision, starting with the most current publication.

**Table 9-1.** Revision History

Revision	Date	Description
B	01/2024	<p>The following is the list of changes in revision B of the document:</p> <ul style="list-style-type: none"> <li>• Updated version numbers in the job file, GUI file folder links in the <a href="#">1. Demo Requirements</a>, <a href="#">2. Demo Prerequisites</a>, and <a href="#">3. Installing the Demo GUI</a> section</li> <li>• Updated <a href="#">Table 4-2</a> in the <a href="#">4.1. Setting up the Hardware</a> section</li> <li>• Updated and replaced <a href="#">Figure 4-3</a> in the <a href="#">4.2.1. Programming the FPGA on the CoaXPress FMC Host Board</a> section</li> <li>• Updated and replaced <a href="#">Figure 4-6</a> in the <a href="#">4.2.2. Programming FPGA on the CoaXPress FMC Device Board</a> section</li> <li>• Updated and replaced all GUI figures in the <a href="#">5. Running the Demo</a> section</li> <li>• Updated and replaced all GUI figures in the <a href="#">6. GenICam GUI Features</a> section</li> <li>• Added <a href="#">7. Testing of CoaXPress FMC Host with Basler Camera</a> section</li> <li>• Updated .zip design file folder link in the <a href="#">8. Appendix A: Running the Tcl Script</a> section</li> </ul>
A	07/2023	<p>The following is the list of changes in revision A of the document:</p> <ul style="list-style-type: none"> <li>• The document is migrated to Microchip template</li> <li>• The document number is updated to DS00005021A from DG0884</li> <li>• Added interoperability information in the <a href="#">Introduction</a> section</li> <li>• Replaced <a href="#">Figure 4-1</a> in the <a href="#">4.1. Setting up the Hardware</a> section</li> <li>• Updated GUI images in the <a href="#">5. Running the Demo</a> section</li> <li>• Added <a href="#">Table 5-1</a> in the <a href="#">5. Running the Demo</a> section</li> <li>• Updated GenICam GUI images in the <a href="#">6. GenICam GUI Features</a> section</li> <li>• Added <a href="#">8. Appendix A: Running the Tcl Script</a> section</li> </ul>
2.0	—	<p>The following is the list of changes in revision 2.0 of the document:</p> <ul style="list-style-type: none"> <li>• Added GenICam functions in <a href="#">Introduction</a></li> <li>• Added <a href="#">6. GenICam GUI Features</a> section</li> <li>• Updated GUI for GenICam support</li> </ul>
1.0	—	This was the first publication of the document

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