Matrox Imaging Library (MIL) 10 Update 36
Release Notes (milClarityUHD)
February 2018

This document outlines what is new regarding MIL support for the Matrox Clarity UHD and explains the current limitations and particularities.

It also presents last-minute information that did not make it into the manual or on-line help. Note that this help file serves to complement your manual. The information found in this file overrides your formally documented material.

Contents

1. MIL Driver for Matrox Clarity UHD

1.1 What's new in MIL 10 Update 36

1.1.1 Summary of new features

The following features are new for this release:

- Supports simultaneous acquisition from up to 8 independent input sources. Use **MdigAlloc()** with **M_DEV*n*** to allocate the digitizer associated with the listed connector, where *n* is the digitizer device number.

Digitizer device #	Connector name	Description
M_DEV0	Mini-HDMI (type C) connector 0	DVI-D and HDMI 2.0 progressive resolutions up to 2160p60 and interlaced resolutions 1080i50, 1080i59.94 and 1080i60.
M_DEV1	Mini-HDMI (type C) connector 1	
M_DEV2	Mini-HDMI (type C) connector 2	DVI-D and HDMI 1.4 progressive resolutions up to 1920 x 1200 p60 and interlaced resolutions 1080i50, 1080i59.94, and 1080i60.
	Analog connector 0	DVI-A progressive resolutions up to 1920 x 1200 p60 and interlaced resolutions (1080i50, 1080i59.94, and 1080i60). SD (analog) resolutions for RS170 (720 x 486 i30), CCIR (720 x 576 i25), NTSC (720 x 486 i30), NTSC/YC (720 x 486 i30), PAL (720 x 576 i25), PAL/YC (720 x 576 i25), NTSC RGB (640 x 480 i30), PAL RGB (768 x 576 i25).

M_DEV3	Mini-HDMI (type C) connector 3 Analog connector 1	Same as M_DEV2.
M_DEV4	Mini Display Port 1.2 connector 0	Display Port 1.2 progressive resolutions up to 2160p60 and interlaced resolutions 1080i50, 1080i59.94 and 1080i60.
M_DEV5	Mini Display Port 1.2 connector 1	
M_DEV6	SDI connector 0	Supports grabbing at up to: SD resolutions NTSC (720 x 486 i30) and PAL (720 x 576 i25). HD resolutions (720p50, 720p59.94, 720p60, 1080p23.98, 1080p24, 1080p25, 1080p29.97, 1080p30, 1080p50, 1080p59.94, 1080p60, 1080i50, 1080i59.94, 1080i60). 2K DCI resolutions (2K 23.98p, 2K 24p, 2K 25p). UHD resolutions (2160p23.98, 2160p24, 2160p25, 2160p29.97, 2160p30, 2160p50, 2160p59.94, 2160p60). 4K DCI resolutions (4K 23.98p, 4K 24p, 4K 25p).
M_DEV7	SDI connector 1	

- Updated the following MIL hardware-specific examples:
  - **MdigCrossBar:** This example (accessible from the revised ExampleLauncher or located in .\examples\board-specific\MdigCrossBar) implements a crossbar switch, where any video input can be sent to any video output. This example required a desktop with multiple monitors to view the grabbed images.
  - **MultiCameraDisplay:** This example demonstrates the acquisition capabilities of Matrox Clarity UHD. Features include:
    - Displaying multiple live streams from multiple boards;
    - No tearing video output;
    - Low latency video output;
    - Live camera addition and removal;
    - Changing the display between windowed and full screen mode;
    - Changing grab buffer pixel formats. Supported pixel formats are: mono8, YUV422 8-bit, YUV422 10-bit (V210), RGB planar, BGR32 8-bit packed, BGR 10-bit packed;
    - Activating image processing on a live stream;
    - Displaying the Feature browser so that the user can control the digitizer and camera settings.

1.1.2 Additions to the command reference

- Added support for **MbufAlloc1d.** Attribute parameter values:

For specifying the intended purpose of the image buffer	
M_DYNAMIC	Specifies an image buffer whose bit-depth and data format are specified by the camera (see M_PFNC_TARGET_FORMAT). To determine the required size of the image buffer, use **MdigInquire** with **M_SIZE_X** and **M_SIZE_Y**, respectively. This value can only be used with **M_IMAGE** and **M_GRAB**. Please refer to board-specific example MultiCameraDisplay.

- Added support for **MdigControl**() with **M_GC_FEATURE_BROWSER**. Unlike with other Matrox products, when using **MdigControl**() with **M_GC_FEATURE_BROWSER**, both the digitizer and system controls are displayed in an interactive dialog box.
- Added support for **MsysHookFunction()** with **M_CAMERA_PRESENT**. This hooks the function to the presence of the camera.
- Added the following new **MbufControl/Inquire()** value:

M_YCBCR_RANGE		Specifies whether the YUV buffer's pixel values are encoded in YCbCr. See the MIL documentation for more information.
	M_DEFAULT	Specifies not to encode the YUV buffer's pixel values in YCbCr. This is the default value.
	M_YCBCR_SD	Specifies to encode the YUV buffer's pixel values using the standard-definition YCbCr standard (ITU-R BT.601).
	M_YCBCR_HD	Specifies to encode the YUV buffer's pixel values using the high-definition YCbCr standard (ITU-R BT.709).
	M_YCBCR_UHD	Specifies to encode the YUV buffer's pixel values using the ultra-high-definition YCbCr standard (ITU-R BT.2020). This is new as of MIL 10 Update 36.

- Added the following new **MdigControl/Inquire()** value:

M_PFNC_TARGET_FORMAT		Specifies whether the buffer supports grabbing into 10-bit image buffers in predefined formats, according to the PFNC. Note that this can only be used with a buffer allocated using **MbufAlloc1d** with an attribute of **M_DYNAMIC**.
	PFNC_BGRa10p	Specifies to grab at a 10-bit color depth with a BGRa format (B:10,G:10,R:10, A:2).
	PFNC_YCbCr422_10p	Specifies to grab at a 10-bit color depth with a V210 format (YUV422 10-bit).

- Added support for grabbing into a native buffer format (allocated using **MbufAlloc1d()** with **M_DYNAMIC**) with **MdigGrab**() and **MdigProcess**(), please refer to hardware-specific example MultiCameraDisplay.

1.1.3 Known limitations and particularities

- The MIL Driver for Clarity UHD supports the following grab buffer formats:
  - monochrome 8-bit;
  - YUV422 8-bit;
  - YUV422 10-bit (V210) using M_DYNAMIC buffers;
  - RGB planar;
  - BGR32 8-bit packed;
  - BGR 10-bit packed using M_DYNAMIC buffers. This pixel format is not supported when grabbing from a source with a resolution of 3840 x 2160 at 50Hz or higher.
- When grabbing from an SDI source into a monochrome 8-bit or BGR32 packed buffer, the Clarity UHD automatically 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). When grabbing into a YUV16 packed buffer the input data is not converted. The color space can be inquired using **MbufInquire** with **M_YCBCR_RANGE**.
- A maximum of 8 simultaneous grabs from HD sources (1080p60) is supported in YUV16 format.
- A maximum of 2 simultaneous grabs from UHD sources (2160p60) is supported in YUV16 and RGB planar formats except when simultaneously grabbing from digitizer device number 0 and 4 or from digitizer device 1 and 5. A maximum of 1 live grab from an UHD source is supported in a BGR32 packed buffer.
- Supports the RGB 4:4:4 and deep color (10-bit) HDMI colorimetry.
- For the SDI inputs, the following features are not supported:
  - Dual-link;
  - 3D;
  - RGB 4:4:4.

- HDMI inputs are unable to capture from copy-protected HDMI sources (e.g., HDCP).
- Onboard H.264 encoding is not supported.
- Windows' automatic 8.3 file name creation needs to be enabled in order for the MIL installer to access the temp folder when the user name contains a space. This option allows Windows to create short file/folder name aliases for ones with long names for programs, such as the MIL installer, that don't support spaces in the file/folder names. Alternatively, the MIL installer needs to run from a user account that belongs to the administrators group and has no spaces in it. Note that the same applies for uninstalling MIL.
- The required Visual C++ 2017 Redistributable needs the presence of KB2919442 and KB2919355. These will need to be obtained and applied before restarting this update.
- The MdigCrossbar example may or may not work on Windows 10 depending on the PC's configuration. Please use the new MultiCameraDisplay example.
- MIL/MIL-Lite 10 must NOT be uninstalled if it was installed BEFORE upgrading to the latest version of Windows 10. Failure to do so will corrupt the Windows 10 installation. A fix is coming to remedy the situation.

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2. Supported operating systems

- 64-bit Windows® 7.
- 64-bit Windows® 10.

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3. Location of examples (in the help file)

In the MIL online help, the location information written at the top of examples might not be up-to-date. Use MIL Example Launcher to find an example on disk.