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                    Matrox Imaging Library (MIL) 10 Update 57
                          Release Notes (MilOrionHD)
                                 January 2017
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This document outlines what is new with MIL for Matrox Orion HD and explains
the current limitations and particularities when using MIL with Matrox
Orion HD.

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

Contents

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1. Matrox Orion HD with MIL.

    1.1 What's new in MIL 10 Update 57.

        1.1.1 Summary of new features.
            Note that MIL Update 57 (U57) is a cumulative update for MIL 10, including all
            content from MIL Update 6 (U6).

            The help for this product should be readily available, as installed boards are
            displayed by default. To display only the Matrox Orion HD information in this
            help file, go to the Customize MIL Help section of Chapter 0: About MIL help.
            Select the Orion HD option from the MIL Systems drop-down list. Unselect all others.
            Select the Non-Matrox computer option from the Computer drop-down list.

            - Support for Microsoft® Windows® 10.

        1.1.2 Bug fixes.

            - Fixed issue that could cause a blue-screen when trying to autodetect an unstable
              source.
            - Fixed issue that could cause an "Cannot communicate correctly with display driver"
              error when allocating the Matrox OrionHD system.
            - Fixed inquire value of MdigInquire(M_SELECTED_FRAME_RATE) when grabbing with a
              SDI 1080i camera.

1.2 What's new in MIL 10 Update 6.

   This update is superseded by Update 57, described above.

   1.2.1 Summary of new features.

      - You can simultaneously capture from up to 4 independent input paths
        (DVI-I and SDI) with the Matrox Orion HD. To do so, you must not use
        it as a graphics controller (from the Matrox PowerDesk, remove all
        used outputs for the Orion HD). If an output is used, only 2 paths
        are available for acquisition.

   1.2.2 Bug fixes.

      - Fixed issue that resulted in a lost frame when grabbing an interlaced signal
        while hardware deinterlacing was disabled and CPU usage was high.

      - Fixed a grab issue that occurred when grabbing from a non-standard signal,
        where the digitizer size-X was not a multiple of 32-bits.

      - Optimized the board-specific example MdigCrossBar when converting a
        BGR32 packed grab buffer to a YUV16 packed buffer.

1.3 What's new in MIL 10.

   This update is superseded by Update 57, described above.

   1.3.1 Summary of new features.

   - Support for Microsoft® Windows® 8.

   1.3.2 API enhancements.

      - Modifications to MdigControl/MdigInquire.

         - MdigControl M_DIGITIZER_SCALING_MODE
             replaced by M_GRAB_SCALE_INTERPOLATION_MODE.
         - MdigControl M_DIGITIZER_INTERPOLATION_MODE
             replaced by M_INPUT_FILTER.

1.4 What's new in MIL 9 Update 66.

   1.4.1 Summary of new features.

      - With some new DCFs, it is possible to update the frame grab at the
        field rate instead of the frame rate.
      - Added support of up to 6 Matrox Orion HD.

   1.4.2 API enhancements.

      - Additions to MdigHookFunction.

         - Added support for M_GRAB_FIELD_END_ODD and M_GRAB_FIELD_END_EVEN
           with new DCF. This allows you to update the frame grab at the
           field rate.

   1.4.3 Bug fixes.

      - Fixed issue where a system has a Matrox M-Series display adaptor with
        a Matrox Orion HD. In some situations, the MsysAlloc() function did
        not work properly.

      - Fixed issue when using MdigGetHookInfo() with
        M_MODIFIED_BUFFER + M_BUFFER_ID of the M_GRAB_END hook function. It
        was returning an invalid MIL_ID buffer.

1.5 What's new in MIL 9 Update 48.

  1.5.1 Summary of new features.

     - About Matrox Orion HD examples:
       - Updated the AutoDetect example.
       - Added a new example: MdigCrossbar.
     - Added support of hardware deinterlacing
      (see M_HARDWARE_DEINTERLACING).
     - Added support of hardware scaling
      (see M_DIGITIZER_SCALING_METHOD).
     - Added support of hardware filtering
      (see M_DIGITIZER_INTERPOLATION_MODE).
     - Added new firmware to support hardware deinterlacing, scaling, and
      filtering. New firmware also fixes SDI output color conversion
      coefficients, according to ITU-R BT.601 in SD mode, and
      ITU-R BT.709-5 in HD mode.

  1.5.2 API enhancements.

     - Additions to MdigAlloc.

       - The InitFlag parameter now has the following:

       - Support for M_MINIMAL.
        The purpose of digitizers allocated with the M_MINIMAL InitFlag
        is for detection of input sources. Grabbing is not permitted with
        these digitizers. If MdigGrab() or MdigProcess() are called, an
        error will be generated. Up to 4 digitizers from M_DEV0 to M_DEV3
        can be allocated simultaneously with this flag.
        MdigHookFunction(M_CAMERA_PRESENT) can be used to receive a
        callback when a camera is connected or disconnected. See the
        Autodetect example.

       - Additions to MdigControl/MdigInquire

       - Support for M_SELECTED_FRAME_RATE.
        - MdigInquire. Inquire returns a MIL_DOUBLE.
         Returns the detected frame rate.

       - Support for M_FORMAT_DETECTED.
        - MdigInquire. Inquire returns an array of type MIL_TEXT_CHAR.
         Returns the detected DCF name.

       - Support for M_FORMAT_DETECTED_LENGTH.
        - MdigInquire. Inquire returns a MIL_INT.
         Returns the number of characters in the M_FORMAT_DETECTED
         string.

       - Support for M_HARDWARE_DEINTERLACING.
        - MdigControl/Inquire. Inquire returns a MIL_INT.
          Supported control values are:
          M_DEFAULT
           Same as M_DISABLE.
          M_DISABLE
           Disable hardware deinterlacing.
          M_BOB_METHOD
           Enable hardware deinterlacing by using the BOB algorithm.
          M_MADI_METHOD
           Enable hardware deinterlacing by using the MADI (Motion
           Adaptive De-Interlacing) algorithm.

          These control values can be added to M_BOB_METHOD and
          M_MADI_METHOD:
           + M_ANTIALIASING
           Enables anti-aliasing.

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                  + M_DITHERING
                    Enables dithering.
                  + M_ANTIALIASING + M_DITHERING
                    Enables anti-aliasing and dithering.

   Note: When using hardware deinterlacing, the grab format must be in
         a YUV color format. So if grabbing a DVI-D signal the grab
         format is automatically changed to YUV.

   - Support for M_DIGITIZER_SCALING_MODE.
       - MdigControl/Inquire. Inquire returns a MIL_INT.
             Supported control values are:
             M_DEFAULT
               Same as M_HARDWARE.
             M_HARDWARE
               Enable hardware scalar. When using vertical and/or
               horizontal scaling, the scaling is done by hardware. The
               scaling interpolation can be controlled with
               M_DIGITIZER_INTERPOLATION_MODE.
             M_SOFTWARE
               Use software scaling. When using vertical and/or
               horizontal scaling, the scaling is done by software.
               The scaling interpolation can be controlled with
               M_DIGITIZER_INTERPOLATION_MODE.

   - Support for M_DIGITIZER_INTERPOLATION_MODE.
       - MdigControl/Inquire. Inquire returns a MIL_INT.
             Supported control values are:
             M_DEFAULT
               Same as M_NEAREST_NEIGHBOR.
             M_NEAREST_NEIGHBOR
               When using vertical and/or horizontal scaling, the
               interpolation mode used is nearest neighbor.
               This value is valid when M_DIGITIZER_SCALING_METHOD is
               either set to M_HARDWARE or M_SOFTWARE.
             M_BILINEAR
               When using vertical and/or horizontal scaling, the
               interpolation mode used is bilinear. This value is valid
               when M_DIGITIZER_SCALING_METHOD is set to M_SOFTWARE.
             M_SMOOTHNESS
               Uses hardware filtering (Gaussian filter).
               This value is valid when M_DIGITIZER_SCALING_METHOD is set
               to M_HARDWARE.

   - Additions to MsysInquire

   - Support for M_PCIE_NUMBER_OF_LANES:
       - Inquire returns a MIL_INT.
             This inquire returns the number of PCIe lanes that are
             currently active with the Matrox Orion HD.

   - Support for M_USER_BIT_COUNT_OUT:
       - Inquire returns a MIL_INT.
             This inquire returns the number of LEDs that can be
             accessible.

   - Support for M_USER_BIT_COUNT_IN:
       - Inquire returns a MIL_INT.
             This inquire returns the number of switches that can be
             configured manually.

   - Support for M_USER_BIT_MODE:
       - Inquire returns a MIL_INT.
             This inquire returns the mode of the user bit.
             Return values are: M_INPUT or M_OUTPUT.

   - Support for M_USER_BIT_VALUE (bit 0 to 5):
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            - Inquire returns a MIL_INT.
                This inquire returns the status of switches situated on the
                top of the board at SW900.

        - Support of M_USER_BIT_VALUE (bit 6 to 9):
            - Inquire returns a MIL_INT.
                This inquire returns the state of the LED situated on the
                bottom of the board at DS300, DS301, DS302, DS303.

        - Additions to MsysControl

        - Support for M_USER_BIT_VALUE:
            - Sets the state of the LED situated on the bottom of the board
                at DS300, DS301, DS302, DS303.

    1.5.3 Behavioral change.

        - When allocating a digitizer with an autodetect DCF and no camera is
          detected, MdigInquire() of M_SIZE_X, M_SIZE_Y, and M_SIZE_BAND now
          returns the size set in MilConfig default values.

        - Fixed issue with MdigInquire(M_SELECTED_FRAME_RATE) with an SDI
          interlaced source. It was returning the field rate instead of the
          frame rate.

        - Fixed issue with MdigInquire(M_CAMERA_PRESENT) when a DVI-D camera is
          connected but is powered off. MdigInquire(M_CAMERA_PRESENT) now
          returns M_NO.

    1.5.4 Bug fixes.

        - Fixed issue with OrionHDBench when multiple Matrox Orion HD boards
          are present.
        - Fixed issue with MdigHookFunction(M_GRAB_END). In some situations a
          hook could be missed.
        - Fixed issue with MdigHookFunction(M_CAMERA_PRESENT). In some
          situations the hook was not called.
        - Fixed issue with MdigHookFunction(M_CAMERA_PRESENT). In some
          situations spikes in CPU usage could occur.
        - Fixed issue with MdigInquire(M_SELECTED_FRAME_RATE) with a DVI-A
          source. In some situations the returned value was off by a few hertz.
          For example it could return 59Hz or 61Hz instead of 60Hz.
        - Fixed issue in OrionHD.sys that could result in a system crash when
          calling MdigAlloc() with a revision 1 board.
        - Fixed issue in OrionHD.sys that could result in a system crash when
          calling MdigAlloc()/MdigFree in a loop.
        - Fixed issue in OrionHD.sys that could result in a system crash when
          continuously connecting and disconnecting a camera.
        - Reduced non-paged memory usage in OrionHD.sys.
        - Fixed issue when doing a ctrl-alt-delete while a grab is in progress.
        - Fixed issue with MdigInquire(M_FORMAT_DETECTED). In some situations
          an NULL value could be returned.

1.6 What's new in MIL 9 Update 24.

        - Additions to MsysAlloc(), System Descriptor parameter:
            - M_SYSTEM_ORION_HD: Allocates a Matrox Orion HD system.

        - The following MdigControls and MdigInquires are supported:
            - M_GRAB_FIELD_NUM
            - M_GRAB_START_MODE
            - M_GRAB_INPUT_GAIN (analog only)

        - The following MdigInquires are supported:
            - M_CAMERA_PRESENT
            - M_SIZE_X
            - M_SIZE_Y
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- M_SIZE_BAND
            - M_INPUT_MODE (returns M_ANALOG, M_DIGITAL)
            - M_COLOR_MODE (returns M_DVI, M_SDI, M_RGB, M_MONOCHROME,
                           M_COMPOSITE or M_EXTERNAL_CHROMINANCE)
            - M_SCAN_MODE (returns M_PROGRESSIVE or M_INTERLACE)
            - M_GRAB_PERIOD (returns value in ms)

      - MdigHookFunction with M_CAMERA_PRESENT is supported.

      - MdigReference is supported on SD analog inputs.

      - Automatic camera detection:
          The automatic camera detection is activated when MdigAlloc() uses
          AutoDetect.dcf.
          When a camera is connected, the following MdigInquires are updated
          according to the camera: M_CAMERA_PRESENT, M_SIZE_X, M_SIZE_Y,
          M_SIZE_BAND, M_INPUT_MODE, M_COLOR_MODE, M_SCAN_MODE, M_GRAB_PERIOD.

      - A new Orion HD-specific example named AutoDetect is now present in
        \Users\Public\Documents\Matrox Imaging\Mil\Examples\Board-Specific\OrionHD\
        It demonstrates how to detect input sources.

      - Additions to MsysInquire():

        - M_BOARD_TYPE:
            M_ORION_HD

        - M_SYSTEM_DESCRIPTOR:
            M_SYSTEM_ORION_HD

        - M_SYSTEM_TYPE:
            M_SYSTEM_ORION_HD_TYPE

        - M_FIRMWARE_REVISION:
            Returns the revision number of the grab firmware.

        - M_TEMPERATURE:
            Returns the current temperature, in degree Celsius of the graphic
            engine.

2. Limitations and particularities.

   - The Matrox Orion HD must be installed in the PC before you start installing the
     MIL Matrox Orion HD driver.

   - Only DirectX® version 9 is supported.

   - Since Matrox Orion HD is designed as a graphics card and uses MIL GPU
     services, it has the same limitations as any other DirectX-capable display
     device.

   - Connecting to the computer, using RemoteDesktop, causes a Direct3D device to
     become lost and not supported with Matrox Orion HD when a graphics
     controller is enabled on the Windows Desktop.

   - Do not enable or disable a graphics controller from Windows Desktop
     while the Matrox Orion HD system (MsysAlloc) is active. This will leave
     the Matrox Orion HD in an unknown state.

   - When automatic camera detection is activated in analog mode, the DCF
     is loaded, by default, in the RGB color space. For example, if the input
     signal is YPBPR 1280x720p @ 60hz, the auto-detect loads, by default, the
     "DVI_A_RGB_1280x720P_60Hz.dcf" DCF, instead of loading the
     "DVI_A_YPrPb_1280x720P_60Hz.dcf" DCF.

   - Extended Display Identification Data (EDID), at the input of DEV_0
     and DEV_1, is expected in digital form. Therefore, if your analog source

expects to receive EDID, the source will not output any signal data.

    - When grabbing four inputs at a time, you might get the
      following error message: "Maximum data video input has been reached."
      In this case, you have to select the DCF representing the YUV source
      data format, on devices 0 and 1. For example, you must use
      DVI_D_RGB_TO_YUV_1920x1080p.dcf instead of DVI_D_RGB_1920x1080p.dcf
      when calling MdigAlloc(); alternatively, you can force the source data format using
      MdigControl with M_SOURCE_DATA_FORMAT set to M_YUV16 + M_PACKED.

3. Supported operating systems.

   This section listed all the supported operating systems.
   - 32-bit Windows® 7
   - 64-bit Windows® 7
   - 32-bit Windows® 8
   - 64-bit Windows® 8
   - 32-bit Windows® 10
   - 64-bit Windows® 10

4. Location of examples (in the help file)

    - In the help file, 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.