

KXI-DVI-Bridge

User's Manual

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Specifications may be subject to change

Safety Compliance Information

Safety Compliance

This equipment complies with:

- CSA C22.2 No. 60950-1-03 / Safety of Information Technology Equipment, Including Electrical Business Equipment.
- UL 60950-1 (1st Edition) / Safety of Information Technology Equipment, Including Electrical Business Equipment.
- IEC 60950-1 (1st Edition) / Safety of Information Technology Equipment, Including Electrical Business Equipment.

CAUTION

These servicing instructions are for use by qualified service personnel only. To reduce the risk of electric shock, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so. Refer all servicing to qualified service personnel. Servicing should be done in a static-free environment.

Electromagnetic Compatibility

- This equipment has been tested for verification of compliance with FCC Part 15, Subpart B, class A requirements for Digital Devices.
- This equipment complies with the requirements of:
 - EN 55022 Class A, Electromagnetic Emissions,
 - EN 61000-3-2 & -3-3, Disturbance in Supply Systems
 - EN 61000-4-2, -3, -4, -5, -6, -8 & -11 Electromagnetic Immunity

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1 KXI-DVI-Bridge Graphic-to-HD/SD Video Interface

This document describes the installation and specification of the KXI-DVI-Bridge. Details of the integration with Kaleido are available in the Kaleido user documentation. Please see “Compatibility” on page 15 for a list of Kaleido models that can be used with the KXI-DVI-Bridge.

1.1 Introduction

Miranda's KXI-DVI-Bridge performs live extraction of computer graphics to generate an SMPTE 292M compliant link meant for the Kaleido multi-image processor. Each unit provides two independent DVI-to-HD-SDI conversion processes.

A firmware upgrade now allows the KXI-DVI-Bridge to also perform conversions of DVI signals from a Kaleido to HD-SDI formats.



1.2 Basic Features

Originally designed as a Kaleido input device, the KXI-DVI-Bridge converts a DVI signal to HD-SDI at a specific resolution and frame rate (1920x1080p @ 29.97 Hz)¹. This allows a Kaleido to accept inputs from a PC at larger VGA resolutions, up to 1600x1200², over a standard HD-SDI signal, without sacrificing quality. The input resolution from the PC can be XGA, SXGA, WXGA, WSXGA+ or UXGA, but must have a 60 Hz refresh rate.

Basic KXI-DVI-Bridge Features:

- Dual Channel – pixel-to-pixel extraction on each discrete channel
- Two HD-SDI outputs per channel
- Auto-sensing DVI input
- One DVI loop output per channel
- Auto-sensing of input format within the Kaleido's HD-SDI input
- Platform/OS independent
- Extend reach of DVI signal by using SDI wiring
- Ideal for static content such as the view of an automation system's run-down list.

¹ The reduced frame rate of 29.97 Hz may not result in a smooth playback of video or animations generated by a computer.

² The 1600x1200 input resolution is supported on the Kaleido-X, but not on the Kaleido-Alto/Quad/Quad-Dual/K2.

1.3 Advanced Features

With the release of version 4.1.5³, the KXI-DVI-Bridge has two modes of operation:

- 1) **Mode A (Static Content):** This is the same functionality as a standard (pre-4.1.5) KXI-DVI-Bridge (see “Basic Features” above). The KXI-DVI-Bridge always outputs at 1920x1080p @ 29.97 no matter what the input is. Best for computer-generated text and static graphics.
- 2) **Mode B (Dynamic Content):** In this mode, the KXI-DVI Bridge can convert DVI signals entering or leaving a Kaleido-X.

Input: The upgraded KXI-DVI-Bridge converts DVI signals to 1920x1080p @ 50/60 Hz or 1280x720p @ 50/60 Hz, suitable for input to a KXI card. The refresh rate is maintained and hence smooth playback of streaming video or computer-generated animations is possible.

Output: The upgraded KXI-DVI-Bridge converts Kaleido output (specifically preset to 1920x1080p or 1280x720p @ 50/60 Hz) to a corresponding HD-SDI 1080i or 720p at the same refresh rate (50/60 Hz). Note that it will not scale to a different resolution.

- Dual-path pixel-to-pixel processing always enabled.
- Anti-flicker filter applied when output is interlaced.
- Output format is automatically selected as follows:

DVI Input	HD-SDI Output
1280x720p @ 50 Hz	1280x720p @ 50 Hz
1280x720p @ 60 Hz	1280x720p @ 59.94 Hz
1920x1080p @ 50 Hz	1920x1080i @ 50 Hz
1920x1080p @ 60 Hz	1920x1080i @ 59.94 Hz

Note: A KXI-DVI-Bridge with older firmware cannot be used at the output of the Kaleido-X.

New systems ship with a dongle that is used to set the device mode. The dongle plugs into the RS-232/GPI port on the rear panel of the KXI-DVI-Bridge. At power-up, the device checks for the presence of this dongle. If it is not present, the device will behave as a Kaleido input device (corresponding to **Mode A** described above). If the dongle is present, the unit behaves as either a Kaleido input device, or an output device (corresponding to **Mode B** described above).



KXI-DVI-Bridge Dongle

Older models of the KXI-DVI-Bridge can be upgraded. The upgrade package consists of new firmware and a dongle. Contact Miranda Technical Support for more information.

³ The KXI-DVI-Bridge version 4.1.5 release corresponds to firmware version 8.0105.

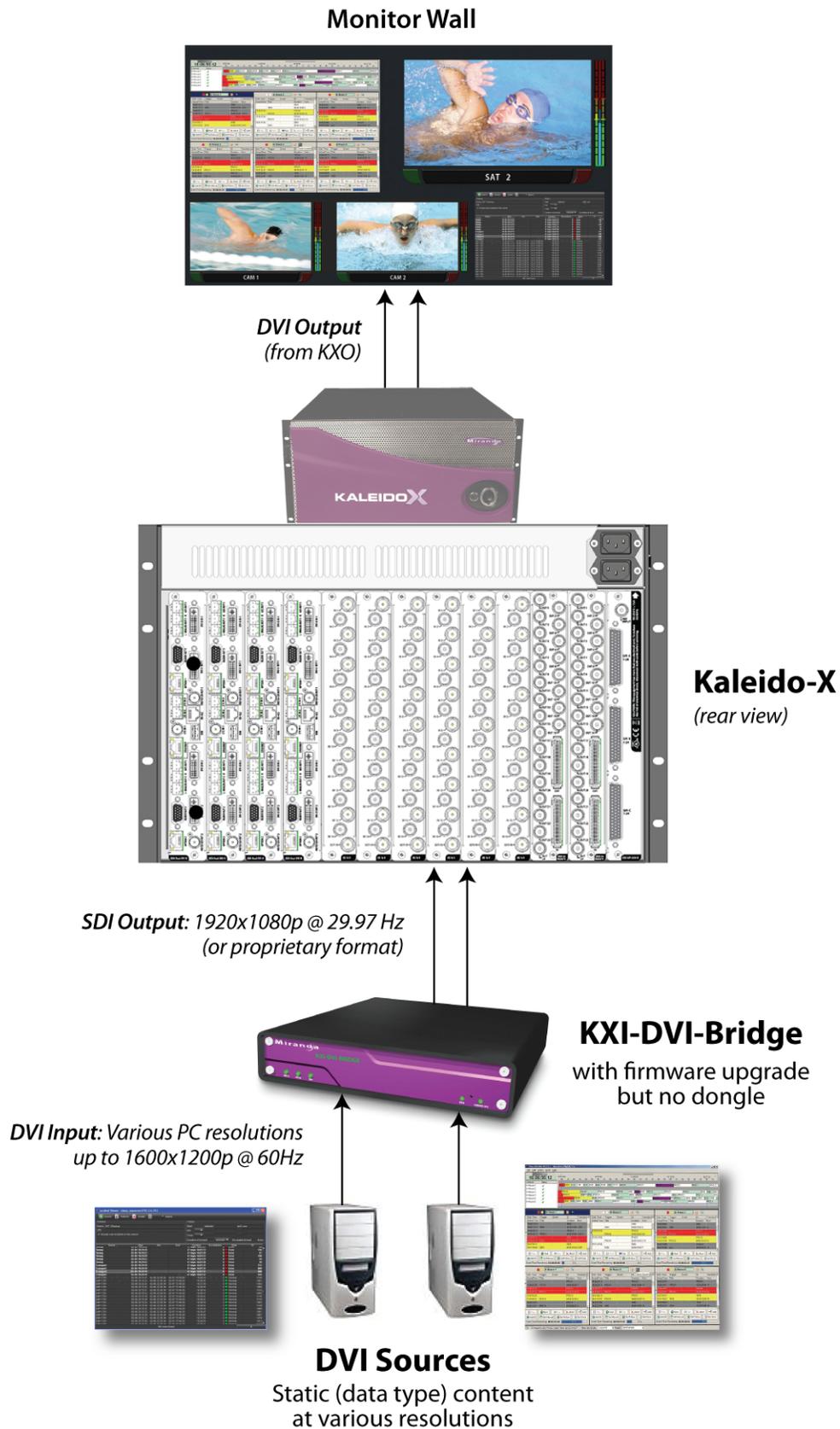


Figure 1.1 Operational Overview — KXI-DVI-Bridge with firmware upgrade, without dongle (Mode A)

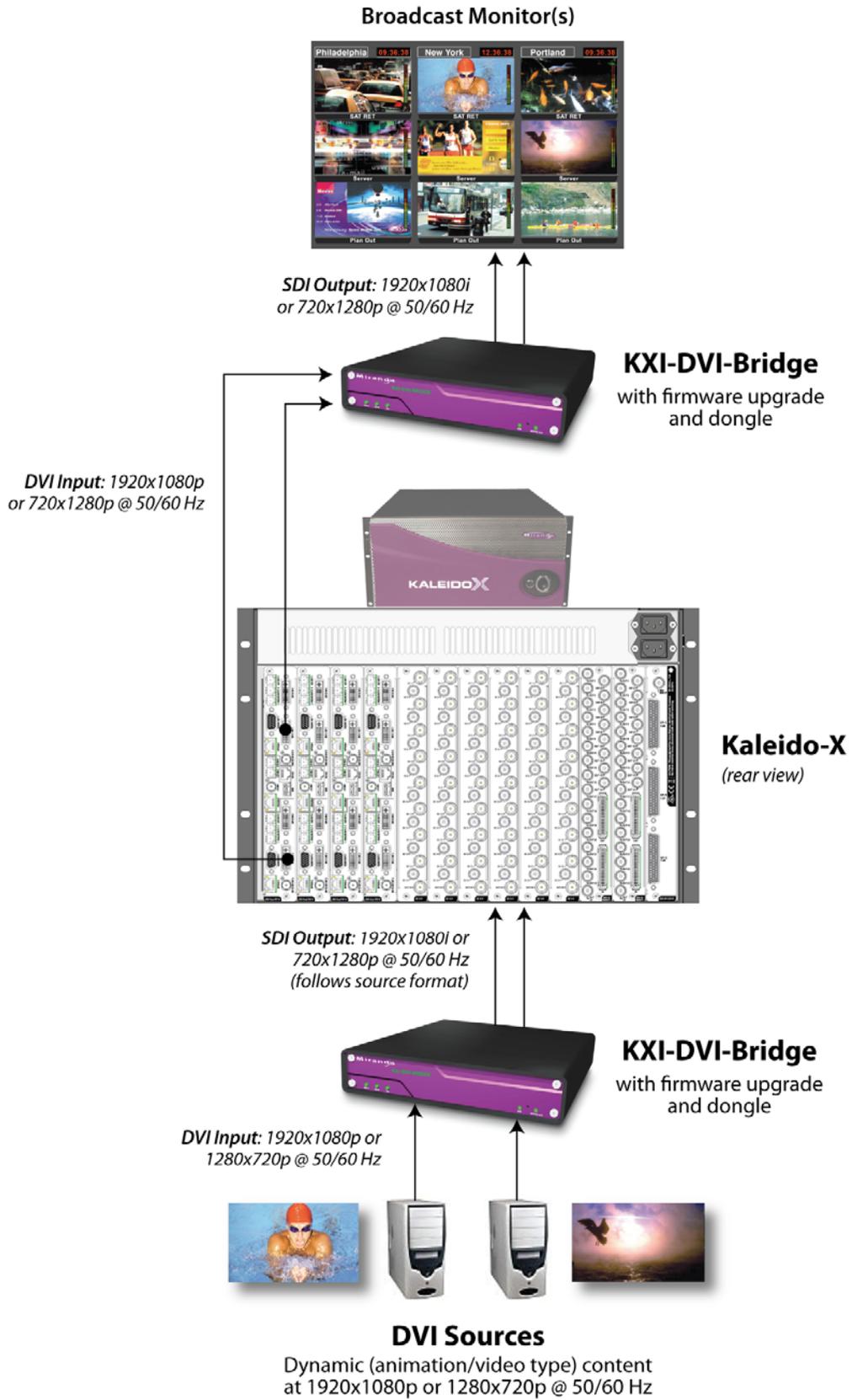


Figure 1.1 Operational Overview — KXI-DVI-Bridge with firmware upgrade and dongle (Mode B)

1.4 Functional Block Diagram

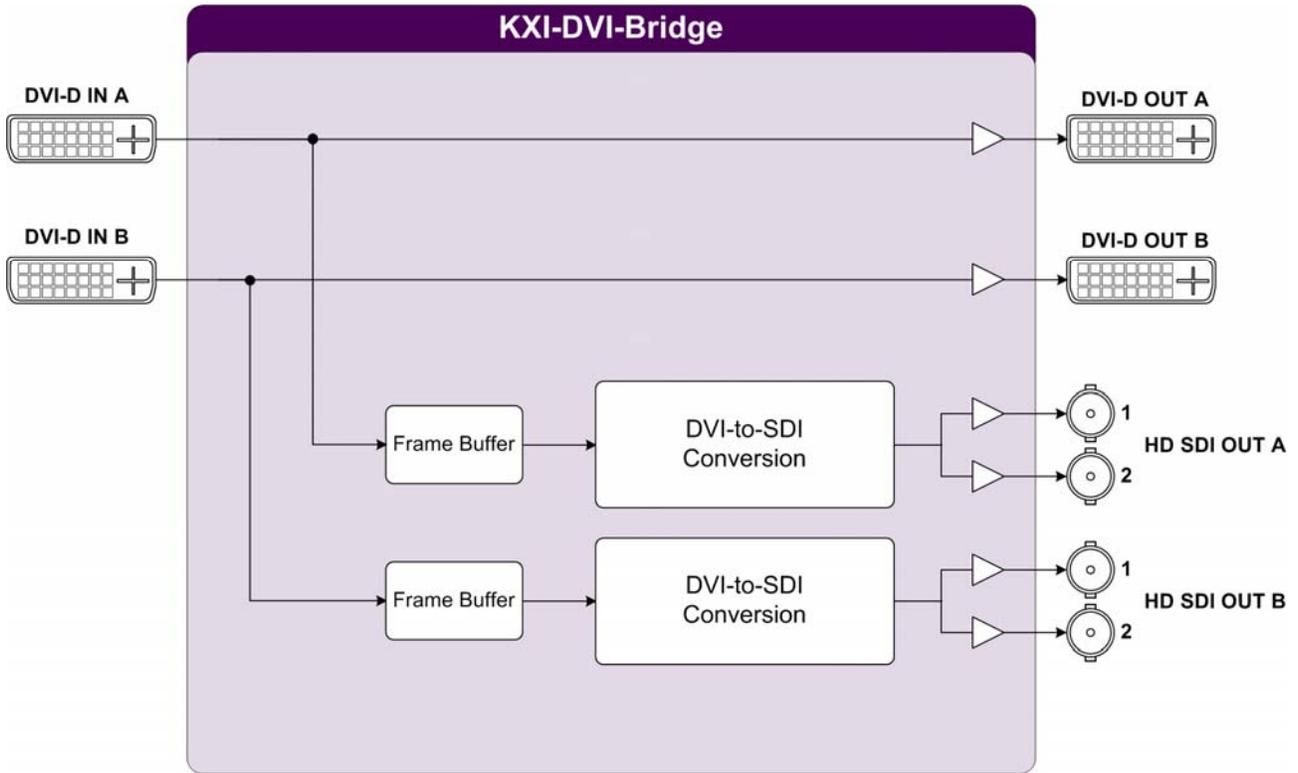


Figure 1.2 KXI-DVI-Bridge Functional Block Diagram

1.5 Front and Rear Panel views

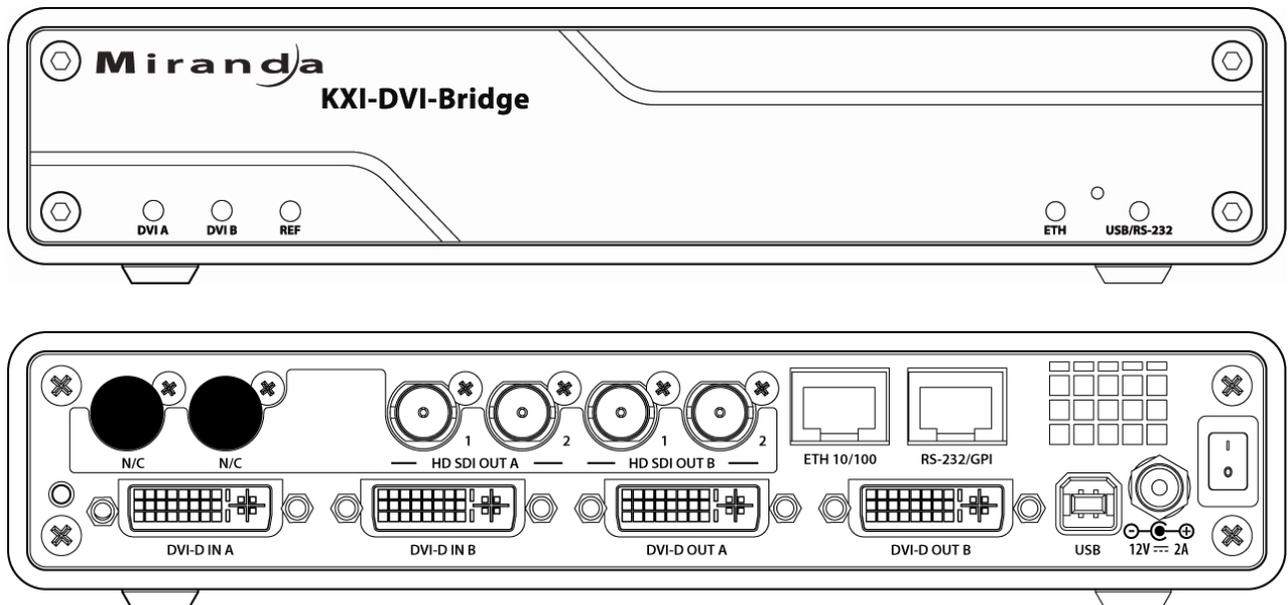


Figure 1-3 KXI-DVI-Bridge Front and Rear panels

2 Installation

2.1 Unpacking

Make sure the following items have been shipped with your KXI-DVI-Bridge. If any of the following items are missing, contact your distributor or Miranda Technologies Inc.

- KXI-DVI-Bridge unit
- AC power cord
- Power supply (AC to 12V DC converter)

2.2 Mechanical Installation

The KXI-DVI-Bridge is packaged in a free-standing case with feet on the bottom, suitable for installation on a desk or tabletop.

The KXI-DVI-Bridge is sized so that two KXI-DVI-Bridge units can be installed side-by-side on a 1 RU tray for rack mounting.

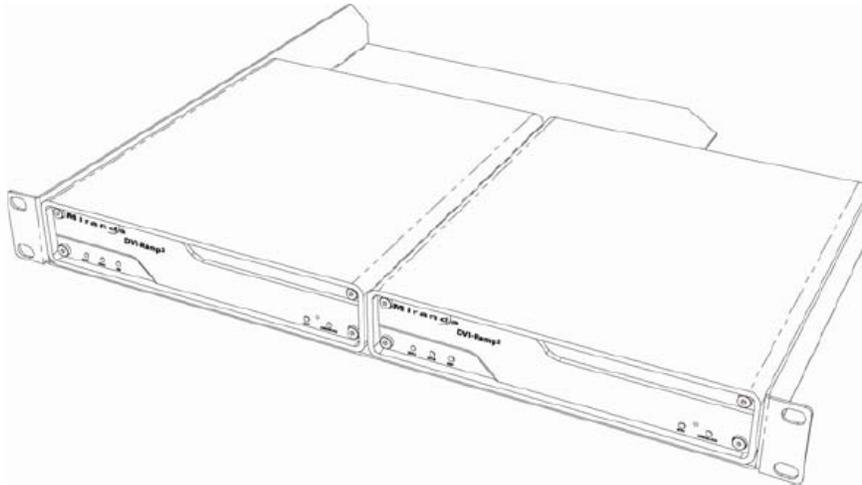


Figure 2.1 Installing two KXI-DVI-Bridge units on a 1 RU tray (TRAY-120)

The rear panel of the KXI-DVI-Bridge includes a threaded connection point for a mounting screw (left side of the rear panel – see figure 2.2) so that the device can be securely mounted on the tray. The Miranda [TRAY-120](#) is recommended, as it is configured to hold the KXI-DVI-Bridge case and incorporates a hole for the mounting screw.

- Before installing the KXI-DVI-Bridge in a tray, you must remove the four rubber feet from the bottom of the case.

2.3 Connections

All inputs and outputs are located on the rear panel of the KXI-DVI-Bridge. Signals and connector types are listed below. The rear panel labels indicate the appropriate connection point for each signal.

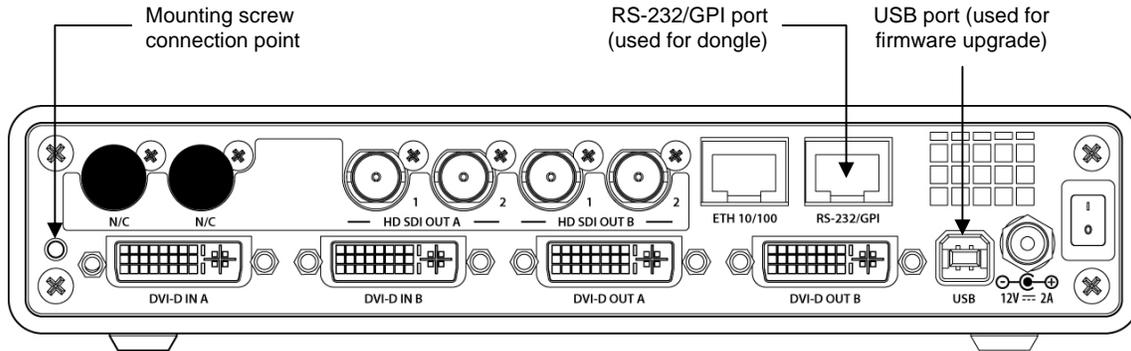


Figure 2.2 Rear panel and connectors of KXI-DVI-Bridge

Signal connections:

- 2 DVI inputs (DVI-D IN A and DVI-D IN B) (DVI connectors)
- 2 DVI outputs (DVI-D OUT A and DVI-D OUT B) (DVI connectors)
- 4 HD-SDI outputs (Out A x 2 and Out B x 2) (BNC connectors)

For optimum performance, high-quality DVI cables should be used. One recommended cable model is D-766 from Cable4PC (www.cable4pc.com)

Dongle:

A dongle with an RJ45 connector ships with new systems, and is included with upgrade packages. Insert this dongle in the RS-232/GPI port on the rear panel of the KXI-DVI-Bridge to enable Mode B functionality (refer to page 2).

3 Operation

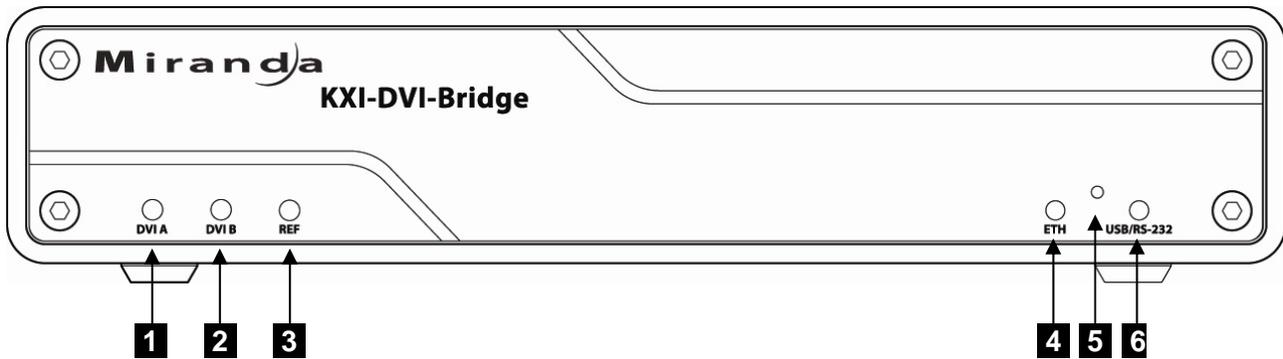
The KXI-DVI-Bridge has no local controls beyond the power switch and the reset pushbutton. The behavior of the unit depends on the input DVI signal(s) and its operating mode. The operating mode is determined ONLY at power-up by the presence or absence of the dongle in the RS-232/GPI port on its rear panel. At power-up, the KXI-DVI-Bridge runs an internal check for the presence of this dongle. If the dongle is not present, the device will only operate as a Kaleido input device (Mode A). If it is present, the unit operates will operate as either a Kaleido input or output device (Mode B). Refer to page 2 for a description of these operational modes.

3.1 Powering Up

The power switch is located on the rear panel of the KXI-DVI-Bridge, just above the power connector. Connect the provided power supply to the power connector and set the switch to ON (I). Make sure the dongle is properly connected if you want to enable output conversion.

3.2 Front Panel Indicators and Controls

There are five Input Status LEDs which are mounted on the front edge of the KXI-DVI-Bridge's circuit board, and which can be seen through holes in the front panel of the case.



Status LEDs

- 1** DVIA GREEN when a valid input is detected on DVI-D IN A
 RED when no valid input is detected on DVI-D IN A
 AMBER when a valid DVI signal is detected but not 60Hz on DVI-D IN A (only for input device mode)
- 2** DVIB When the DVI input mode is DUAL-HEAD mode (software configuration):
 GREEN when a valid input is detected on DVI-D IN B
 RED when no valid input is detected on DVI-D IN B
 AMBER when a valid DVI signal is detected but not 60Hz on DVI-D IN B (only for input device mode)
- 3** REF OFF – no reference – not used
- 4** ETH OFF – no link – not used

6 USB/RS-232 OFF – No USB

GREEN when USB is recognized by the PC

ORANGE FLASHING when transmitting packets

ORANGE QUICK FLASH – heart-beat with USB connection available. This indicates that firmware is in working order

RED QUICK FLASH – heart-beat with no USB connection available. This indicates that firmware is in working order

At power-up, this LED is OFF

Controls

Only one control is provided at the front panel:

5 RESET button The RESET button is a dual-function control, and operates as follows:

- Quick push and release – resets the USB communication port.
- Push and hold for 5 seconds before releasing – copy the display settings to the KXI-DVI-Bridge input. This ensures that the input of the KXI-DVI-Bridge will mimic the display that is connected to its DVI output.
 - Settings on "DVI-D OUT A" are copied to "DVI-D IN A"
 - Settings on "DVI-D OUT B" are copied to "DVI-D IN B"

Use a bent paper clip or equivalent thin wire to activate the RESET button through the hole in the front panel.

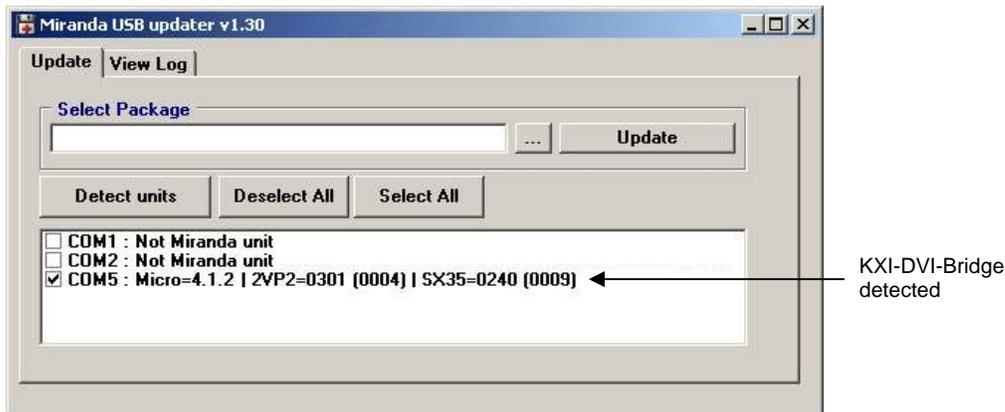
4 Firmware Upgrades

Firmware updates for the KXI-DVI-Bridge may be issued occasionally. The firmware update package, including the firmware upgrade utility (**Miranda USB updater**), can be obtained from the Miranda Technical Support web site: <http://www.miranda.com/portal/>:

1. In a web browser, navigate to the software download page of Miranda Tech Support web portal: <http://www.miranda.com/portal/downloads.php>
2. In the Products column, find **KXI-DVI-Bridge**, then click **download**.
3. Under **Software / Firmware** click **Download Firmware** to download a .zip archive containing the latest firmware update package.
4. Unzip the contents of the archive to a temporary folder.

The firmware of the KXI-DVI-Bridge can be updated via its USB port.

1. Connect the KXI-DVI-Bridge to a Windows PC using a USB cable. The KXI-DVI-Bridge has a USB port on its rear panel.
2. Install the USB driver for the KXI-DVI-Bridge (it is the same as the DVI-Ramp2 driver). See the section on **Windows Driver Installation** for details.
3. Launch the **Miranda USB updater** utility on the PC.
4. Click **Detect units**.



5. Click in the checkboxes as needed to deselect everything except the COM port corresponding to the KXI-DVI-Bridge connection.
6. Click the button (...) beside the **Select package** field and browse to the firmware update file (of the form DR2UPDATE_vXXX-bXXXX.zip).
7. Click **Update**.

The USB/RS-232 LED on the front panel turns amber during the update. When the process is completed successfully, the unit will reboot. Disconnect the KXI-DVI-Bridge from the PC and connect it to a Kaleido to resume operation using the new firmware.

5 Windows Driver Installation

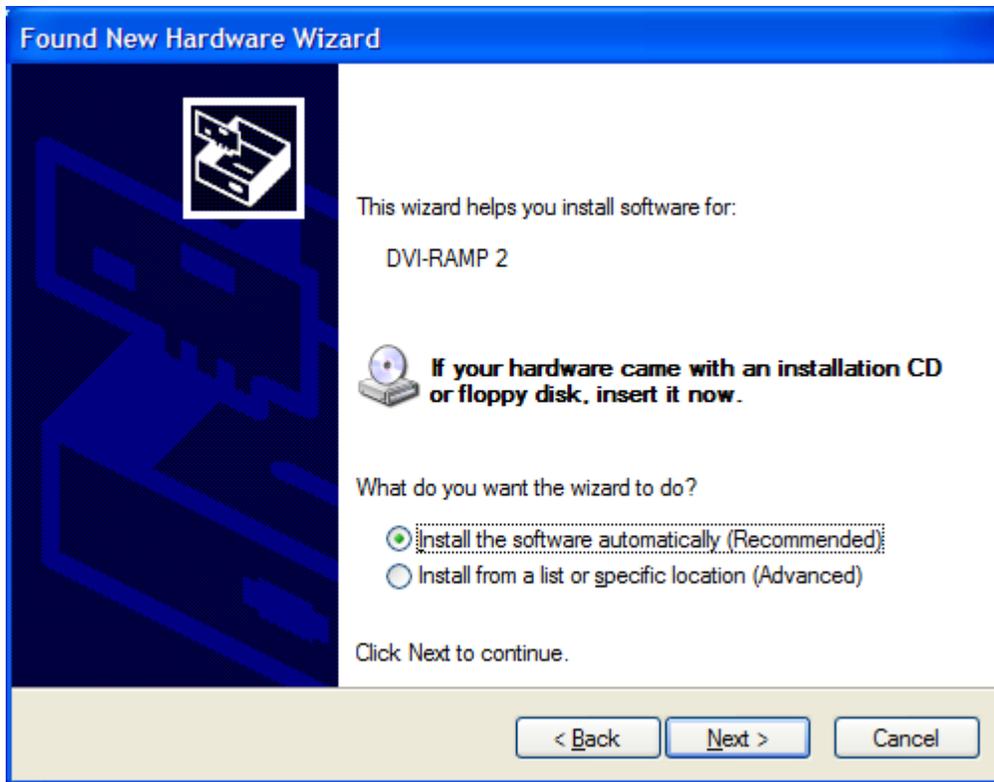
This section contains a step-by-step guide on how to install the DVI-Ramp2 USB driver on Windows platforms. This driver is also used with the KXI-DVI-Bridge.

NOTE: To perform this installation, you must have administrator privileges on your PC.

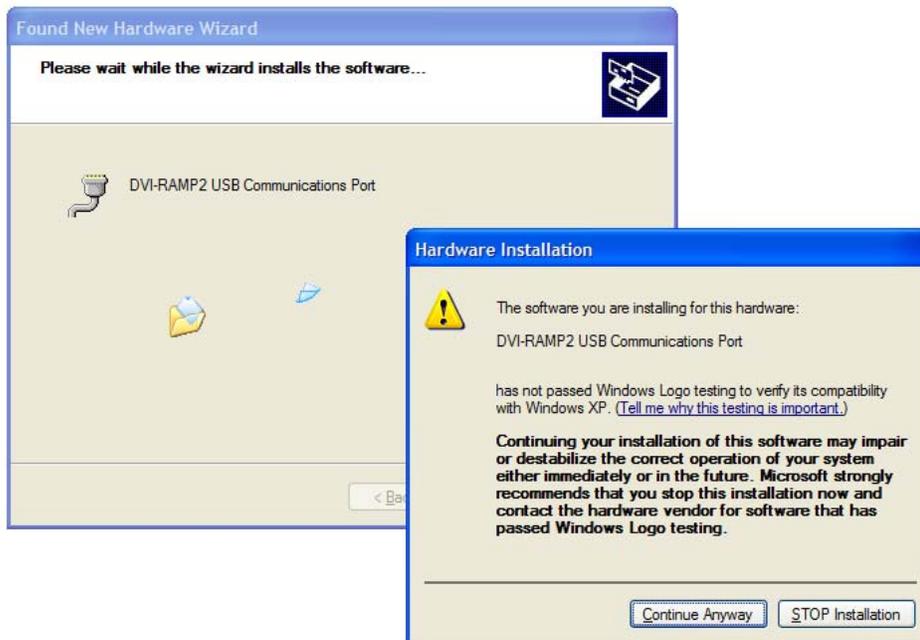
1. In a web browser, navigate to the software download page of Miranda Tech Support web portal: <http://www.miranda.com/portal/downloads.php>
2. In the Products column, find **KXI-DVI-Bridge**, then click **download**.
3. Under **Software / Firmware** click **Download Windows Driver** to download the following file: **miranda_dviramp2_usb_XP_Vista.zip**
4. Unzip the contents of **miranda_dviramp2_usb_XP_Vista.zip** to a temporary folder.
5. From this temporary folder, double click **installdriver.bat** to copy the necessary files.
6. Connect the KXI-DVI_Bridge to the PC with a USB cable.
7. Power up the KXI-DVI_Bridge. The “Found New Hardware” wizard appears on your PC:



8. When prompted to connect to Windows Update, select “**No, not this time**”
9. Click **Next**

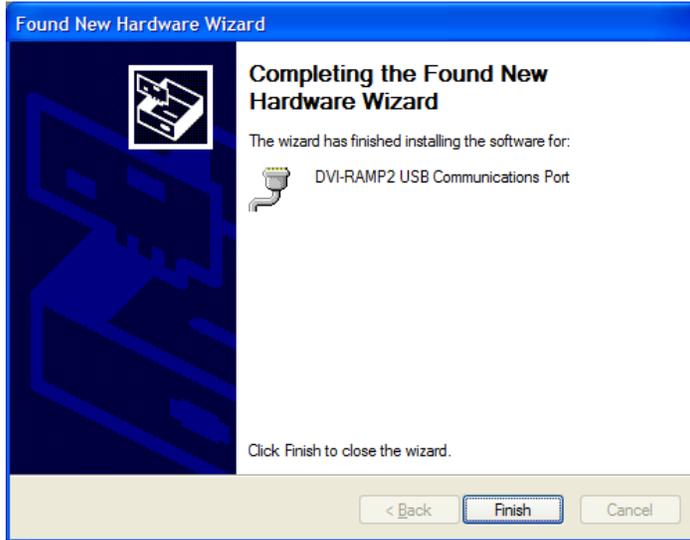


10. When prompted for an installation CD, select “**Install software automatically. (Recommended)**”.
11. Click **Next**.
12. During installation, a “Windows Logo testing” warning may appear:



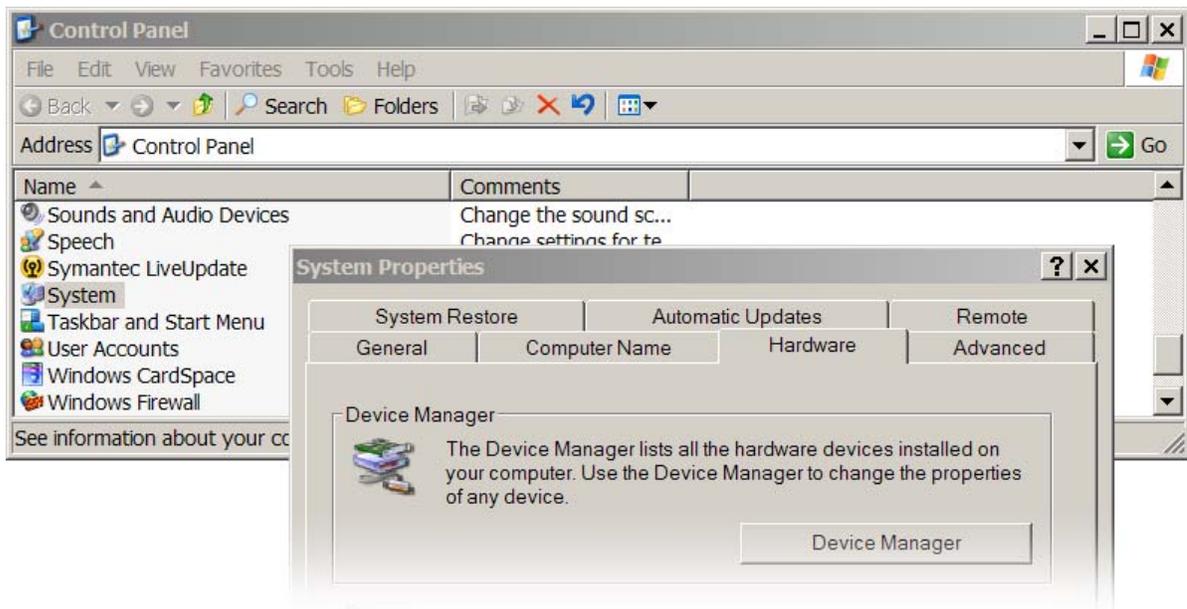
13. Click **Continue Anyway**.

14. Once the DVI-RAMP2 USB driver installation is completed, a confirmation appears:

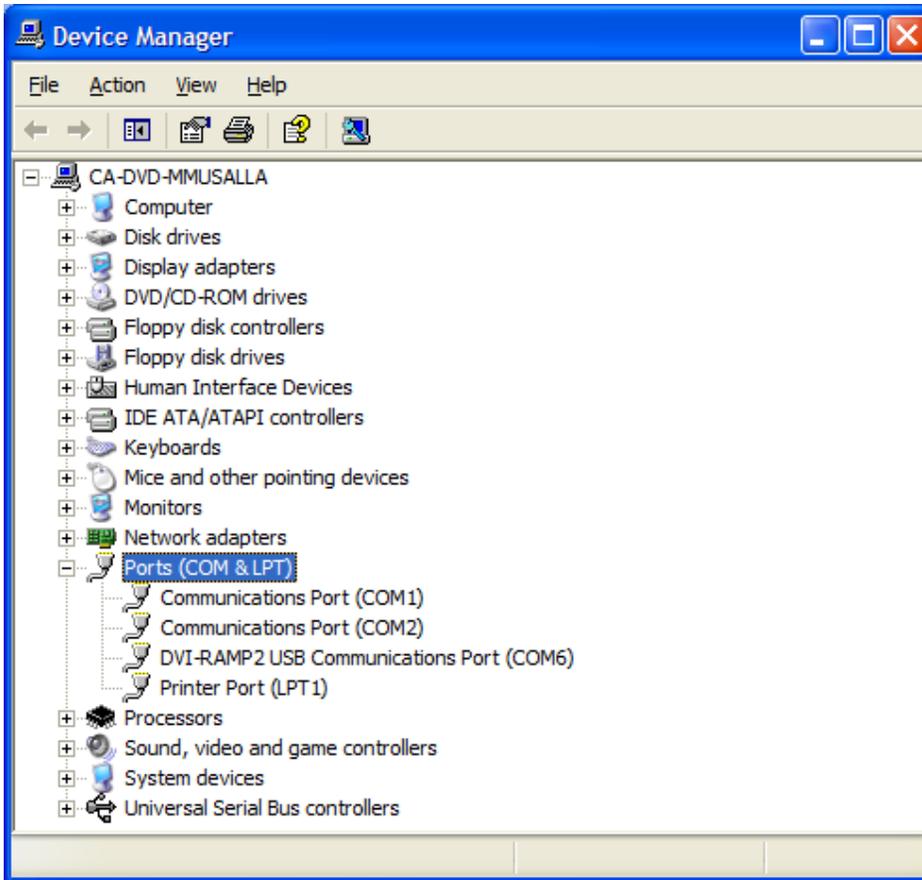


15. Click **Finish**.

16. To verify your installation, open the Windows **Device Manager** control panel.



17. Under **Ports** you will find a device named **DVI-RAMP2 USB Communications Port (COMx)**, where the "x" specifies the COM port on which the KXI-DVI-Bridge is loaded.



6 Technical Specifications

COMPATIBILITY

The KXI-DVI-Bridge is compatible with the following Kaleido systems:

- Kaleido-K2 (all models with MWI-HDX cards)
- Kaleido-Alto-HD
- Kaleido-Quad-HD
- Kaleido-Quad-Dual
- Kaleido-X (all models)

INPUT

DVI (x2)

SIGNAL: Digital Visual Interface (DVI Revision 1.0)

CONNECTORS: DVI-D SINGLE-LINK.

FORMATS:

Without dongle:

DVI Resolution
1024x768 (XGA)
1280x1024 (SXGA)
1366x768 (WXGA)
1680x1050 (WSXGA+)
1600x1200 (UXGA) → generates a proprietary HD-SDI format; supported on the Kaleido-X only

With dongle:

DVI Resolution
1280x720
1920x1080

OUTPUT

HD-SDI (x4)

SIGNAL: SMPTE 292M (1.485/1.001 Gbps)

FORMATS:

Without dongle:

HD 1920x1080p @ 29.97, or a proprietary output format if the input format is 1600x1200

With dongle:

DVI Input	HD-SDI Output
1280x720 @ 50 Hz	1280x720p @ 50 Hz
1280x720 @ 60 Hz	1280x720p @ 59.94 Hz
1920x1080 @ 50 Hz	1920x1080i @ 50 Hz
1920x1080 @ 60 Hz	1920x1080i @ 59.94 Hz

RETURN LOSS >15 dB up to 1.5 GHz

JITTER < 0.2 UI p-p above 100 KHz

DVI (x2) Pass-through from input

OTHER

POWER 22 W @ 12V (Universal AC Adaptor supplied)

FORM FACTOR Standalone – half-width of standard 19" rack
1 RU high, 8 13/16" deep (224 mm) including BNC connectors

PROCESSING DELAY The processing delay through the KXI-DVI-Bridge will vary in time because of the frame-sync operation required to adapt the DVI data rates to the SDI data rates. A frame-sync drops or repeats video frames at the output to adapt to the input rate. At 60 Hz, the delay will vary approximately from 4 ms to 37 ms. At 50 Hz, the delay will vary approximately from 4 ms to 44 ms.

Contact Us!

Miranda Technical Support

For technical assistance, please contact the Miranda Technical Support centre nearest you:

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