Kaleido-Alto
Kaleido-Quad

Installation Manual

M791-4200-101

Multi-Image Display Processor

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Miranda
Technologies inc.
3499 Douglas-B. -Floreani
St-Laurent, Québec, Canada H4S 1Y6

Tel. 514-333-1772
Fax. 514-333-9828
www.miranda.com

Kaleido-Alto
Kaleido-Quad

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) Incorporating A1, A2, A3, A4, and A11/ 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.

CONTACT MIRANDA

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

Americas
Telephone:
+1-800-224-7882
e-mail:
techsupp@miranda.com

Asia
Telephone:
+81-3-5730-2987
e-mail:
asiatech@miranda.com

Europe, Middle East, Africa, UK
Telephone:
+44 (0) 1491 820222
e-mail:
eurotech@miranda.com

France (only)
Telephone:
+33 (0) 1 55 86 87 88
e-mail:
francetech@miranda.com

Visit our web site at www.miranda.com

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1 Kaleido-Alto & Kaleido-Quad

1.1 Introduction

The Kaleido-Alto and Kaleido-Quad multi-image processors can display multiple video inputs (up to 10 for Alto, up to 4 for Quad) on a single high resolution output. The Kaleido-Alto/Quad combines the display of video windows, audio level metering, text identification labelling, tallys and in-screen status indicators in a convenient single RU frame. Various models are offered to support SDI video, composite video or the auto-detection of composite and SDI. Four stereo audio level meters can be displayed inside or outside each video window. Audio sources can be extracted from the embedded audio inside the SDI signals, or input via optional audio mezzanines providing 4 or 10 AES or Analog stereo input signals. A DVI input allows the insertion of an external computer signal to fill the background of the video layout. The layout can be created using the KEdit software and applied to the system afterward. Layouts and frequently-used functions can be operated via the Kaleido-RCP or via a mouse/pointer interface. Even though the Kaleido-Alto/Quad is not equipped with the entire Kaleido-K2 extended function set, it is an ideal solution in areas where fewer signals need to be monitored with fine picture quality. Its compact 1 RU frame is a real asset in areas where space is restricted.

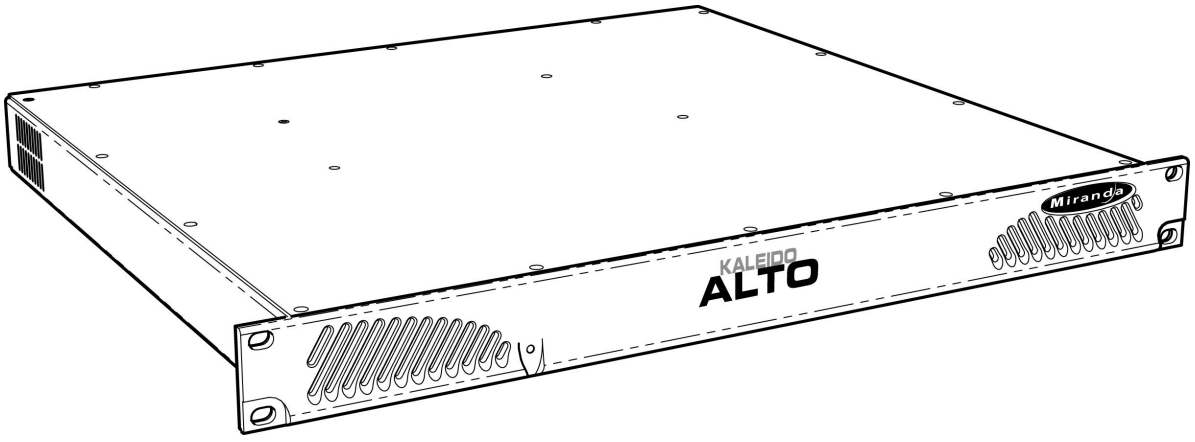
The Kaleido-Alto/Quad is available in several different models:

1.2 Kaleido-Alto Series: Supports up to 10 video inputs.

Kaleido-Alto HD
The Kaleido-Alto HD is configured with 10 auto-detect HD/SD-SDI/Composite video inputs. Each input is capable of displaying HD/SD-SDI and Composite video input in PAL, SECAM , NTSC or Black & White formats automatically

Kaleido-Alto AD:
The Kaleido-Alto AD is configured with 10 auto-detect SD-SDI/Composite video inputs. Each input is capable of displaying SD-SDI with 525 or 625 lines and Composite video input in PAL, SECAM, NTSC or Black & White formats automatically

Kaleido-Alto A:
The Kaleido-Alto A offers 10 Composite inputs. Each inputs auto-detects PAL, SECAM, NTSC or Black & White formats.



Kaleido-Alto Features

- Auto-sensing HD-SDI, SDI and Analog Composite inputs (10)
- High quality DVI and RGBHV outputs with up to 1920 x 1080 pixel resolution (except Kaleido-Alto-A and Kaleido-Alto-AD models, which are limited to 1280 x 1024)
- Embedded, AES and Analog audio level metering with monitoring outputs
- Source IDs, Tallies, clocks (time of day and up/down timers)
- Easy offline layout editing with full choice of window ratio (4:3 and 16:9) and position
- Aspect ratio markers
- Compact (1 RU) frame
- Optional redundant power supply
- Optional, simple to use remote control panel

Kaleido-Alto Configuration

Here is a typical configuration for a Kaleido-Alto, in this case illustrating an Alto AD.

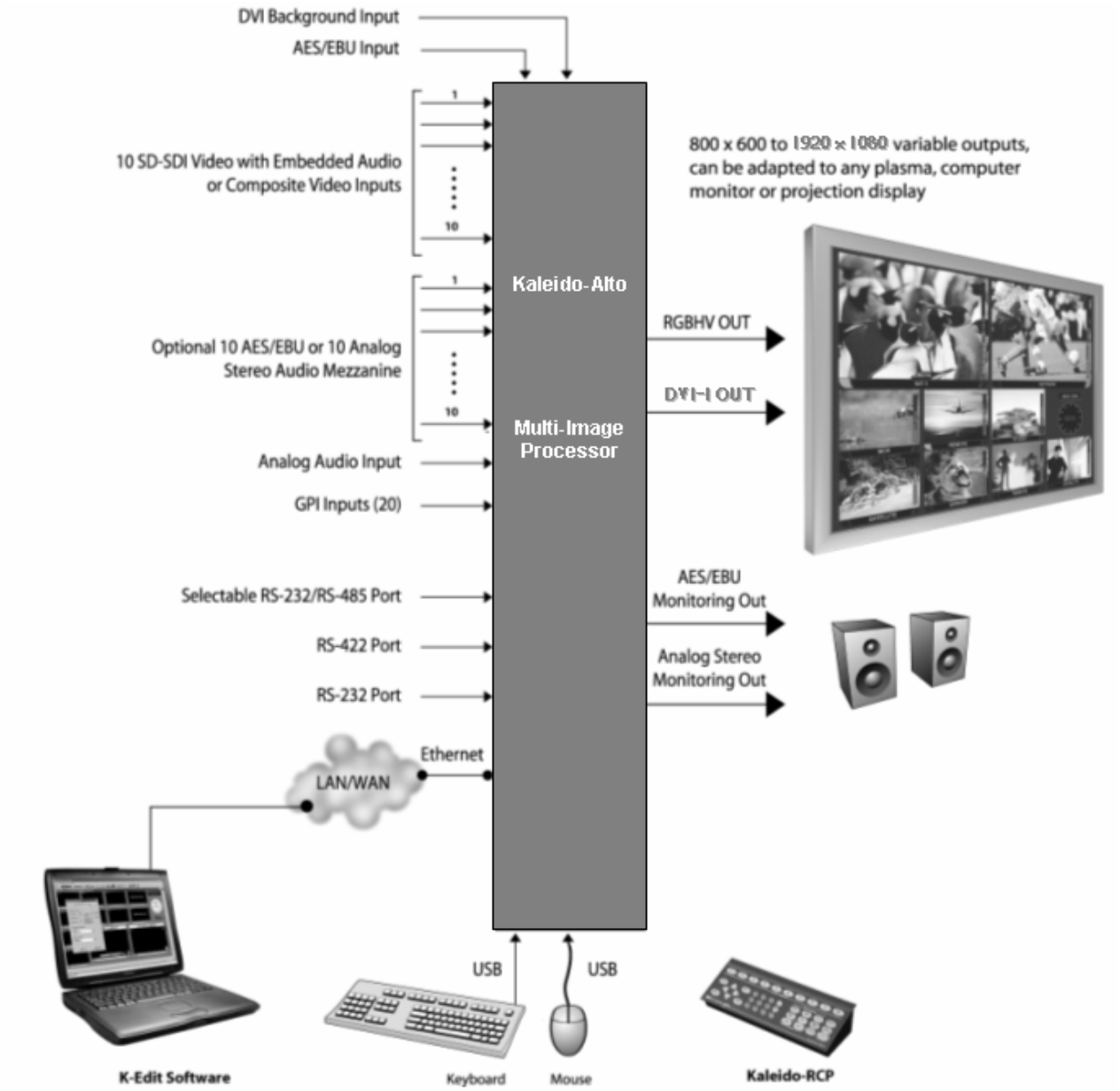


Figure 1.1 *Kaleido-Alto AD Configuration*

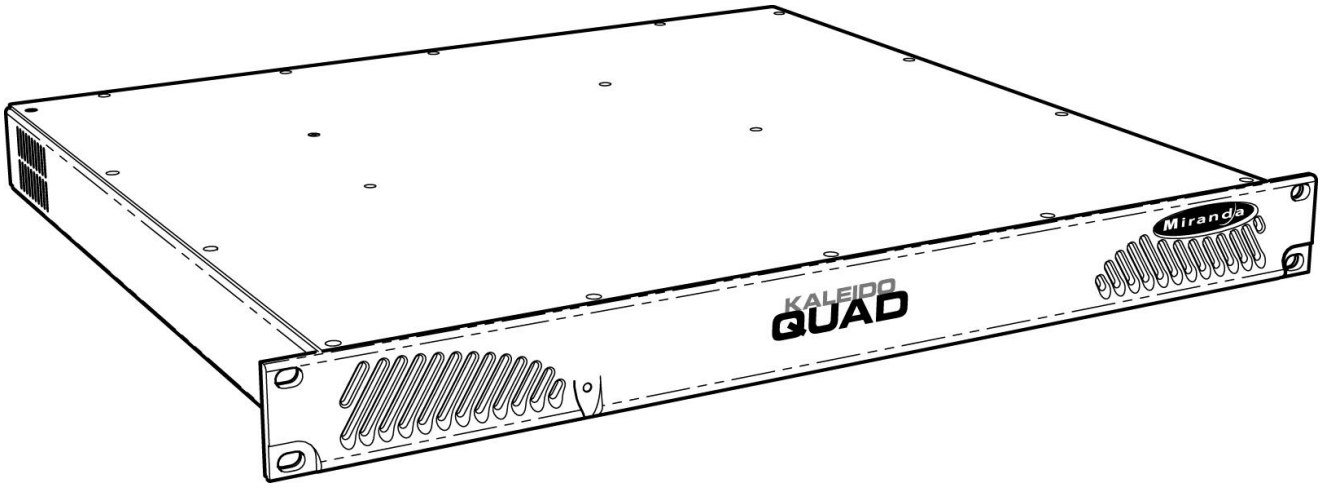
1.3 Kaleido-Quad Series: Supports up to 4 video inputs.

Kaleido-QUAD HD

The Kaleido-QUAD HD is configured with 4 auto-detect HD/SD-SDI/Composite video inputs. Each input is capable of displaying HD/SD-SDI and Composite video input in PAL, SECAM , NTSC or Black & White formats seamlessly.

Kaleido-QUAD AD

The Kaleido-QUAD AD is configured with 4 auto-detect SD-SDI/Composite video inputs. Each input is capable of displaying SD-SDI with 525 or 625 lines and Composite video input in PAL, SECAM, NTSC or Black & White formats seamlessly.



Kaleido-Quad Features

- Auto-sensing HD-SDI, SDI and Composite inputs (4)
- High quality DVI and RGBHV outputs with up to 1920 x 1080 pixel resolution
- Embedded, AES and Analog audio level metering with monitoring outputs
- Source IDs, Tallies, clocks (time of day and up/down timers)
- Easy offline layout editing with full choice of window ratio (4:3 and 16:9) and position
- Aspect ratio markers
- Compact (1 RU) frame
- Optional redundant power supply
- Optional, simple to use remote control panel

Kaleido-Quad Configuration

Here is a typical configuration for a Kaleido-Quad, in this case illustrating a Quad AD

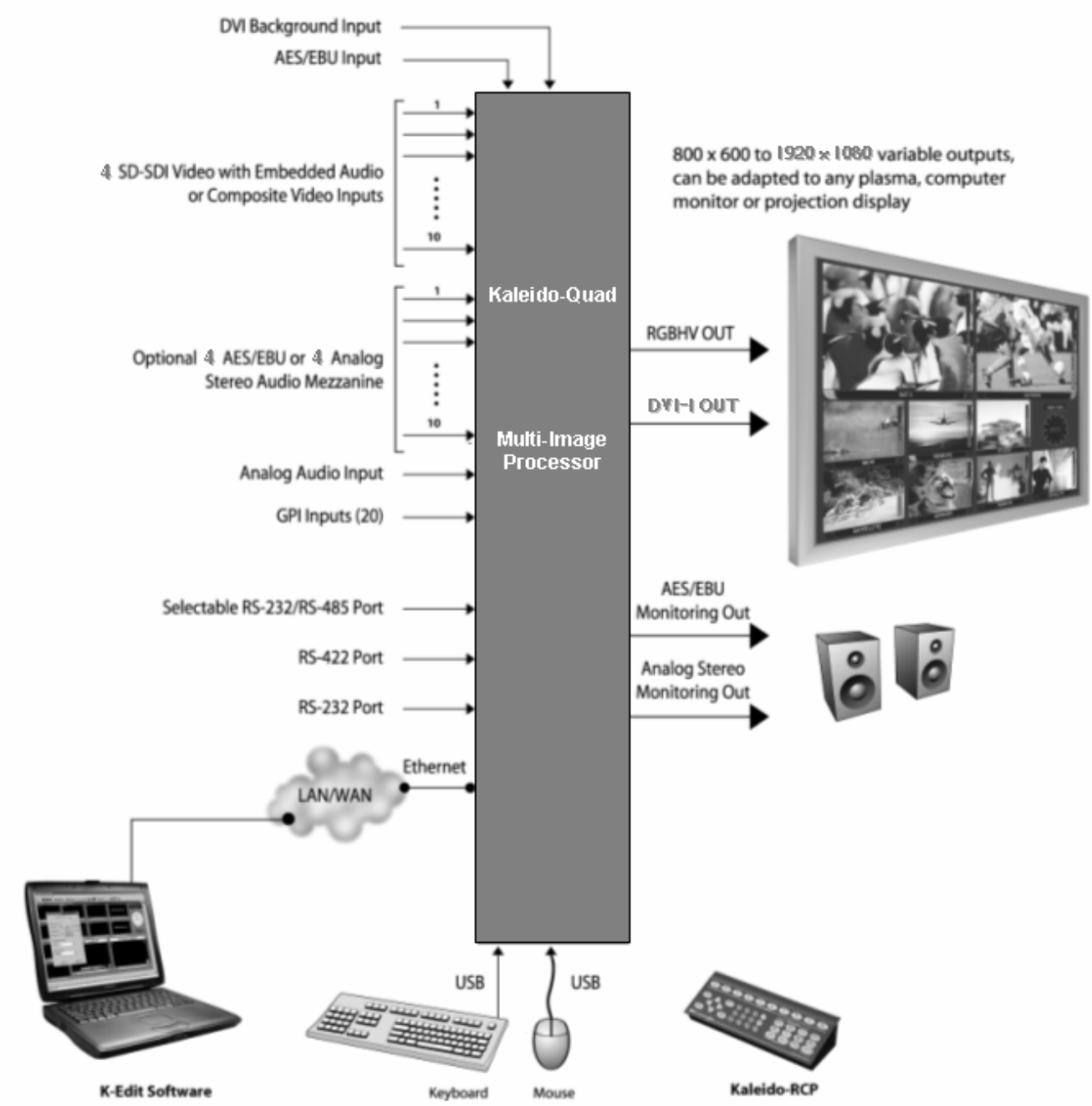


Figure 1.2 *Kaleido-Quad AD Configuration*

2 Installation

2.1 Unpacking

Make sure the following items have been shipped with your Kaleido-Alto/Quad. If any of the following items are missing, contact your distributor or Miranda Technologies Inc.

- Kaleido-Alto or Kaleido-Quad unit
- a USB mouse
- AC power cord
- CD-ROM with software

2.2 Mechanical Installation

Kaleido-Alto/Quad may be installed in a standard 19" rack, using the proper screws and washers (not included). The optional Kaleido-RCP Remote Control Panel may also be installed in a rack using the optional mounting kit (order part #1229-1100-100).

For proper ventilation, make sure the front and side panel air vents are not blocked and the air filter is clean.

2.3 Power Connection

Connect the supplied AC power cord to the rear-panel AC receptacle, and secure it with the retainer clip attached to the receptacle. The Kaleido-Alto/Quad includes a universal power supply for 110V and 220V operation.

2.4 Signal and Control Connections

All inputs and outputs are located on the rear panel of the Kaleido-Alto/Quad. Signals and connector types are listed and described below. The rear panel labels indicate the appropriate connection point for each signal.

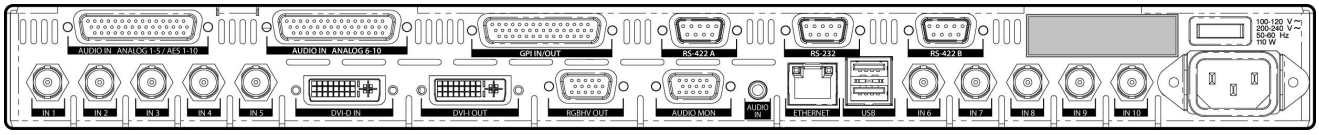


Figure 2.4.1 *Kaleido-Alto AD/A Rear panel*

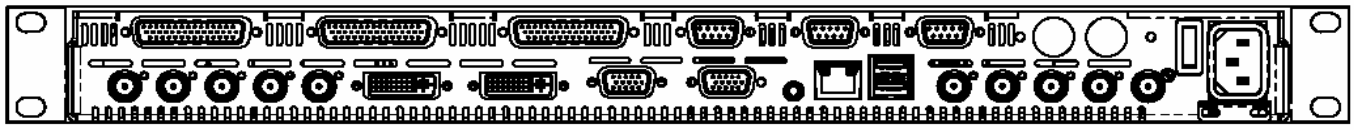


Figure 2.4.2 *Kaleido-Alto HD Rear panel*

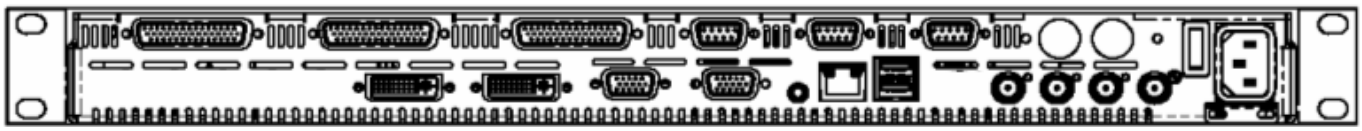


Figure 2.4.3 *Kaleido-Quad HD/AD Rear panel*

The following chart summarizes the various inputs and outputs appearing on the rear panels of these units, and is followed by a discussion of each of the connections.

Kaleido					Signal connections & communication ports	Connector type
Quad		Alto				
AD	HD	A	AD	HD		
	4			10	Video inputs HD-SDI	BNC
4			10		Video inputs SD-SDI	BNC
		10			Video inputs Composite	BNC
1	1	1	1	1	DVI input (DVI connectors)	DVI-D
4 or 10	4 or 10	4 or 10	4 or 10	4 or 10	AES/EBU or stereo analog audio input (optional)	DB-44S
1	1	1	1	1	PC audio input	3.5 mm jack
1	1	1	1	1	component analog (RGBHV) output	DE-15P
1	1	1	1	1	DVI output	DVI-I
1	1	1	1	1	Audio monitoring output	DE-15P
20	20	20	20	20	GPI inputs	DB-44S
10	10	10	10	10	GPI outputs	DB-44S
1	1	1	1	1	Ethernet communication	RJ-45
1	1	1	1	1	RS-422 A port	DE-9
1	1	1	1	1	RS-232 port	DE-9
1	1	1	1	1	RS-422 B port	DE-9
2	2	2	2	2	Mouse and Keyboard	USB type A

Table 1: *Signal connections*

Note that one set of BNC connectors serves all video inputs except the DVI inputs. The Kaleido-Alto/Quad will auto-detect the type of signal applied, and process it appropriately.

HD-SDI Video Inputs

These inputs must conform to the SMPTE 292M-C standard. The following input formats are supported:

Display Aspect Ratio	Active Pixel	Active Lines	Total Pixels	Total Lines	Pixel Aspect Ratio	Scan Form.	Frame Rate (Hz)	Line Rate (KHz)	Pixel Rate (MHz)	Std. (SMPTE)
16:9	1920	1080i	2200	1125	SQR	2:1	29.97	33.72	74.18	274M
16:9	1920	1080i	2376	1250	SQR	2:1	25	31.25	74.25	295M
16:9	1280	720	1650	750	SQR	1:1	59.94	44.96	74.18	296M
16:9	1280	720	1980	750	SQR	1:1	50	37.5	74.25	296M

Make sure the input cable has a maximum length of 100m (325') (Belden 1694) and that all serial digital video connections are point-to-point. For instance, there must be a point-to-point connection between the IN BNC and the source equipment. If a T-connector is used to connect other equipment, the maximum specified cable length is no longer valid.

SD-SDI Video Inputs

The inputs are on BNC connectors and accept 4:2:2 serial digital video signals in either 525 or 625-line format. These inputs must conform to the SMPTE 259M-C standard.

Make sure the input cable has a maximum length of 225m (730' using Belden 1694A), and that all serial digital video connections are point-to-point. For instance, there must be a point-to-point connection between the IN BNC and the source equipment. If a T-connector is used to connect other equipment, the maximum specified cable length is no longer valid.

Composite Video Inputs
The inputs are BNC connectors, internally terminated and accept NTSC, PAL, SECAM and monochrome (B&W) video signals. NTSC-M signals must conform to the SMPTE 170M standard and PAL (625/50), PAL-M (525/60) signals must conform to the ITU-R BT.470-6 standard.

DVI Input
A DVI signal may be connected to the Kaleido-Alto/Quad to provide a background image behind the monitoring windows. Supported DVI signal resolutions are shown in the table 2.4.1 below.

Kaleido					Resolution	Scanning format	Line rate (khz)	Frame rate (hz)	
Quad		Alto							
AD	HD	A	AD	HD	(H x V)				
X	X	X	X	X	800 x 600	Progressive	37.7/31.4	59.94	50
X	X	X	X	X	1024 x 768	Progressive	48.4/40.3	59.94	50
X	X	X	X	X	1280 x 768	Progressive	48.1/40.1	59.94	50
X	X	X	X	X	1280 x 1024	Progressive	64/53.3	59.94	50
X	X	X	X	X	1360 x 768	Progressive	47.6/39.8	59.94	50
X	X			X	1600 x 1200	Progressive	74,9/62.5	59.94	50
X	X			X	1920 x 1080	Progressive	69.5/62.5	59.94	50

Table 2.4.1 *Supported DVI input signal resolutions*

Note that the 1600X1200 and 1920X1080 formats apply only to selected models, and that special consideration is required when using them. ***See the Annex for more information***.

Analog Audio Inputs (optional Alto-SA mezzanine with 10 or 4 Inputs)
This option provides inputs for 10 or 4 channels of analog stereo audio. Two DB-44S connectors are available on the Alto-SA mezzanine.

Connect balanced analog stereo audio signals to the audio input connectors. Each connector receives 5 stereo inputs (refer to figure 2.4.4 below for connector pinout). **For the 4-input audio version only inputs IN 1-4 are available.**

To facilitate cabling of the audio inputs, a terminal block adapter is available separately (Miranda P/N 0686-9800-100). A lexan is provided to identify the terminal assignment for the input connectors. See figure 2.4.6 for lexan installation on the Alto-TBA-AG terminal block adapter.

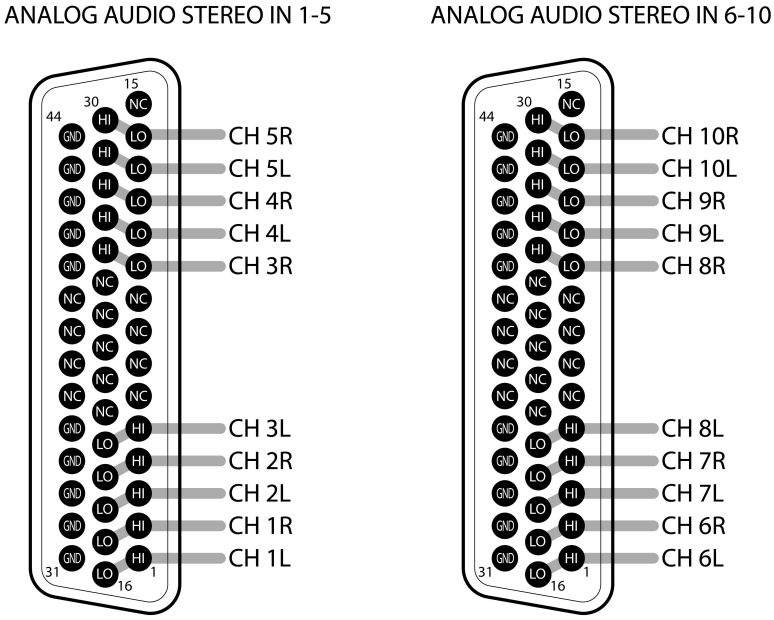


Figure 2.4.4 *Analog audio connector pinout*

Digital Audio Input (optional Alto-AES mezzanine)
This option provides inputs for 10 or 4 channels of AES/EBU digital audio. A single DB-44S connector is available on the Alto-AES mezzanine.

Connect AES balanced audio signals to the audio input connector. Signal must conform to AES3-1992/ANSI S4.40-1992 standard. The DB-44 connector receives 10 inputs (refer to figure 2.4.3 below for connector pinout). **For the 4-input audio version only inputs IN 1-4 are available.**

To facilitate cabling of the audio inputs, a terminal block adapter is available separately (Miranda P/N 0686-9800-100). A lexan is provided to identify the terminals assignment for the input connectors. See figure 2.4.4 for lexan installation on the Alto-TBA-AG terminal block adapter.

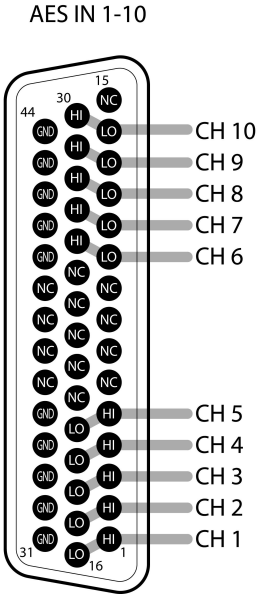


Figure 2.4.5 *AES-EBU connector pinout*

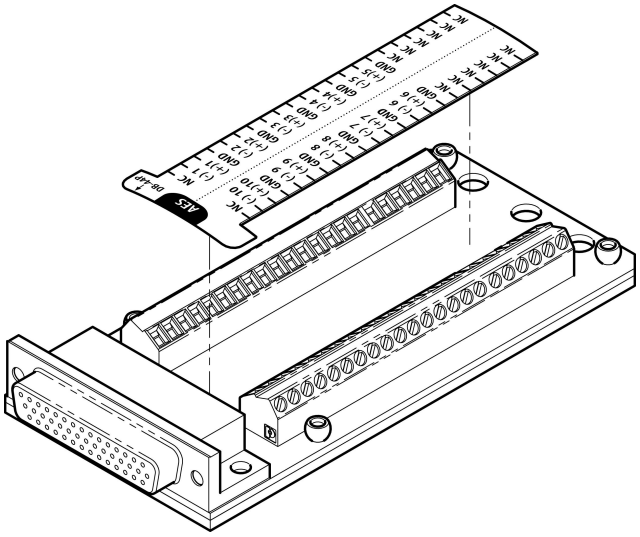


Figure 2.4.6 *Lexan installation on Alto-TBA-AG*

PC Audio input
Connect a 3.5mm audio jack to provide an analog stereo audio input coming from a personal computer. Note that this audio signal is input at its nominal level, which is controlled by the originating computer. Make sure that the level is within specifications (see section 4 Technical Specifications) by adjusting the level on the originating computer.

Component analog (RGBHV) output
Analog progressive scan component video output (DE-15P connector). Connector pinout is shown in figure 2.4.7 below.

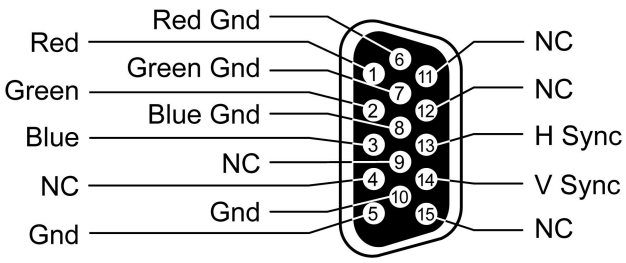


Figure 2.4.7 *DE-15P connector pinout*

DVI output
Digital progressive scan component output (DVI digital connector), with resolutions as shown in the chart on page 10 for the DVI input..

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

Audio monitoring output
A DE-15P connector is provided to monitor one stereo audio channel, in both balanced AES3 and analog formats. Refer to figure 2.4.8 for connector pinout.

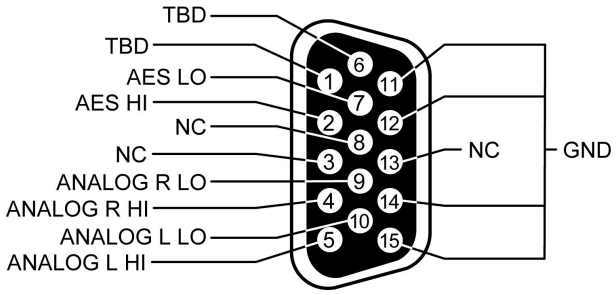


Figure 2.4.8 *Audio monitoring connector pinout*

GPI inputs /outputs
The GPI input connector provides interfaces and processing to support 20 contact closure tally inputs and provisions to support 10 outputs using DB-44S connectors. The connector pinout and circuit schematics are shown in figure 2.4.9 and 2.4.10 below.

To facilitate cabling of the GPI inputs and outputs, a terminal block adapter is available separately (Miranda P/N 0686-9800-100). A double-sided lexan is provided to identify the terminals assignment for both input and output connectors. Place the lexan as indicated in figure below, and install cables and plug the adapter into the connector.

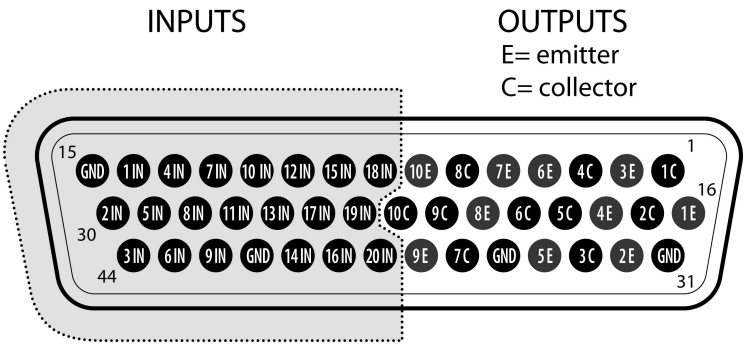


Figure 2.4.9 *GPI Connector pin-out*

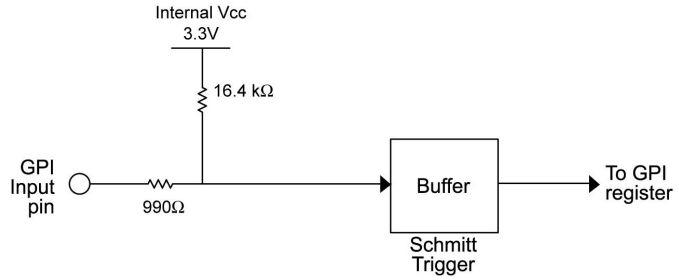
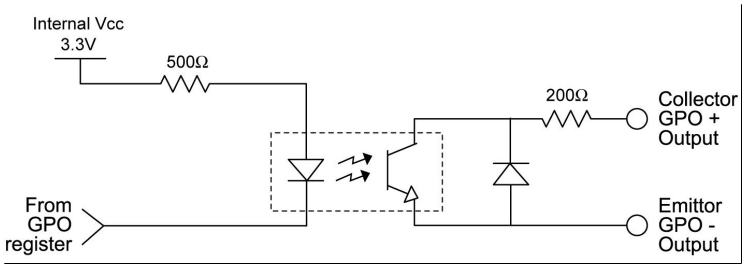
GPI input characteristics: *Signal:* 20 short-to-ground inputs *Connector:* DB-44S	
GPI output characteristics: *Signal:* 10 opto-isolated contact closures *Connector:* DB-44S *Characteristics:* • Max differential voltage: 12 VDC • Max sink current: 70 mA • Isolation voltage: 2500 VRMS	

Figure 2.4.10 *GPI I/O Characteristics*

RS-422 A

DE-9S connector for connecting remote control devices such as routers or the Kaleido-RCP (12V is supplied through pin 5 to the Kaleido-RCP).

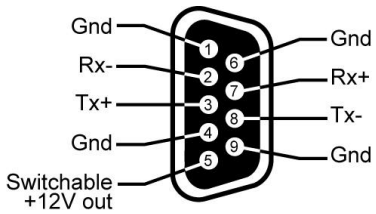


Figure 2.4.11 *RS-422 A Connector pin-out*

RS-232
DE-9P connector to connect to router status information sources for tracking UMDs or inputting time code using a device such as Miranda's "Little Red".

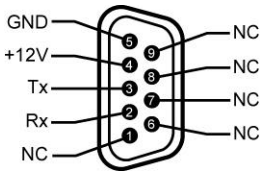


Figure 2.4.12 *RS-232 Connector pin-out*

RS-422 B
DE-9S connector for connecting remote control devices such as routers.

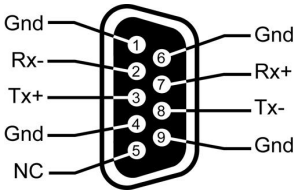


Figure 2.4.13 *RS-422 B Connector pin-out*

Ethernet
An RJ-45 connector for 10/100 BASE-T Ethernet interface connection to LAN/WAN networks using TCP-IP.

USB
Dual USB 1.0 ports used to connect a mouse (supplied) and keyboard to allow the user to operate the Kaleido-Alto/Quad. The Kaleido-Alto/Quad will not work with a multi-function keyboard (i.e. with volume controls or internet , so make sure to use a simple, basic USB keyboard.

2.5 Dual power supplies (Optional)

The Kaleido-Alto HD and the Kaleido-Quad HD/SD can be configured with dual power supplies. The figure shows the location of the power supplies in the base configuration (single power supply) and the option dual-supply configuration.

The user can associate a software Alarm with these power supplies in order to monitor their status from a remote location via iControl.

2.6 Multiple Kaleido-Alto/Quad Installations

2.6.1 Ethernet Connection for use with KEdit

KEdit software is used to create layouts for the Kaleido Alto/Quad. Each Kaleido Alto/Quad can have layouts created specifically for its application requirements. These layouts are created on a PC running KEdit software (described in its own manual) and uploaded to the Kaleido-Alto/Quad via Ethernet, each Kaleido-Alto/Quad having its own IP address.

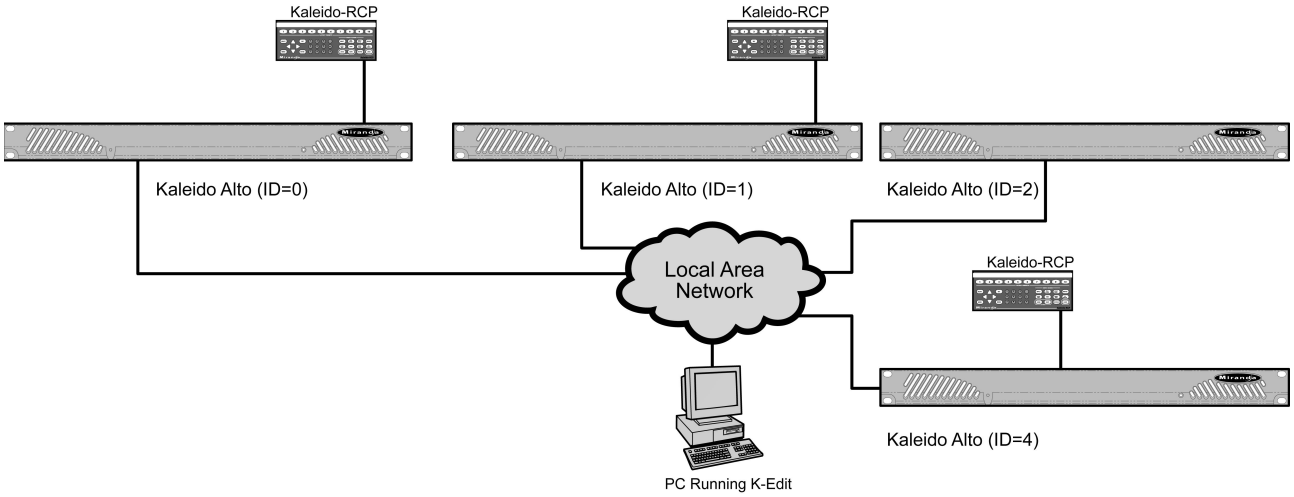


Figure 2.5.1 *Kaleido-Alto/Quads connected to an ethernet network*

2.6.2 Controlling Multiple Kaleido-Alto/Quads using RS-422 with a Kaleido-RCP

Using the RS-422 A communication port allows up to 99 daisy-chained Kaleido-Alto/Quad frames to be controlled using only one Kaleido-RCP, through the use of a multidrop cable. Figure 2.5.2 illustrates cabling between the Kaleido-Alto/Quads and the Kaleido-RCP.

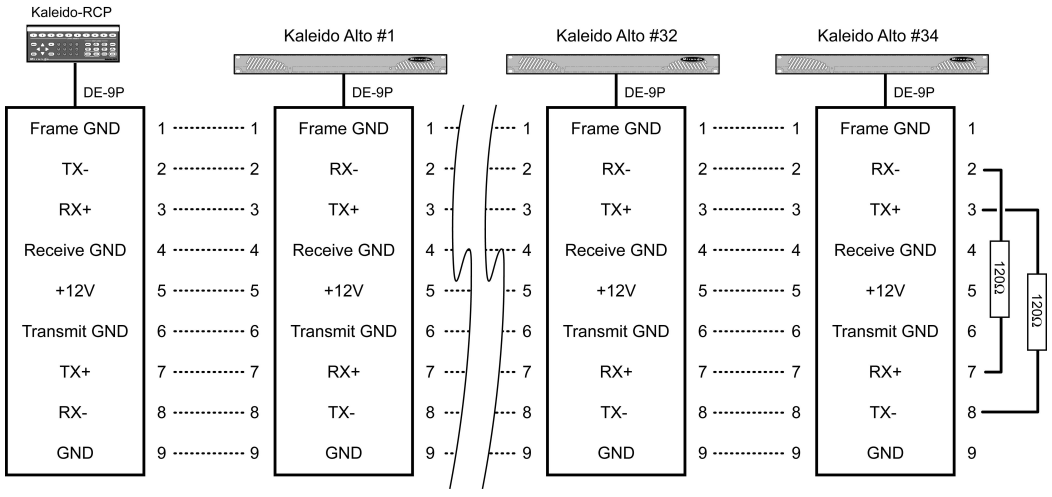


Figure 2.5.2 *Kaleido Alto/Kaleido-RCP interconnection for cascading multiple frames*

For this to work, the Kaleido-RCP must be able to send commands to a specific Kaleido-Alto/Quad in the daisy-chain. This is accomplished by assigning an identification code to each of the Kaleido-Alto/Quad frames.

By default, Kaleido-RCP will send instructions using RS-422 protocol to ID 1. This means that a system comprised of only one Kaleido-Alto frame will work out of the box as each frame's default ID is also set to 1. However, for applications where more than one Kaleido-Alto/Quad frame is used, you will need to assign a unique ID number to each of them. Consult the Kaleido-Alto/Quad software User's Manual for details.

As indicated in the figure above, a 120 Ω termination resistor must be installed on the cable connector on the last Kaleido Alto frame. In a point-to-point connection, it must be installed on the receiver; for a more-than-one Kaleido-Alto/Quad frame connection (called a "multidrop connection"), it must be installed on receiver **and** driver. For more details, consult Miranda Application Note #229-99T00-101.

3 Operation

The Kaleido-Alto has no local controls beyond the power switch. Operational concerns are outlined here, but for detailed operating instructions, see the Kaleido Alto Software Operation Manual. Periodically, new software versions may be uploaded using "live update" through the ethernet connection.

3.1 Powering Up

The power switch is located on the rear panel of the Kaleido-Alto/Quad, just above the power cord. Plug the cord into an appropriate AC power supply, and set the switch to ON (I). **If you have just switched the unit OFF (0), always wait a few seconds before turning it ON again to ensure proper startup procedure.**

3.2 Front Panel Status LED

There is a system status LED mounted on the front panel of the Kaleido-Alto/Quad. This LED gives operational status when powering up the unit, and signals any malfunction of the unit. Note that this LED does not report on the status of the inputs connected at the back.

Figure 3.1 *Front panel Status LED (Same location on Alto and Quad)*

At startup, the LED will briefly light up red, then flashing yellow. After 10 to 15 seconds the LED lights up green to indicate normal system operation. Other states may be:

Yellow (continuous):	system boot-up problem or live update not completed correctly.
Red (continuous):	system failure.

3.3 Startup and Preparation to Use Software.

The Kaleido Alto is shipped with the current version of the software installed, and configured to auto-start when the system is powered on. Upon initial startup, the system will present the default monitoring window at its output. Upon subsequent start-ups, the system will present the last monitoring window that was present before shut-down. See the software manual for detailed instructions on how to operate the software.

3.4 Installation of Software

In case of recovery from system failure, or when software is being updated, it is necessary to install the Kaleido-Alto and K-Edit software. This software is delivered on a CD-ROM which is included in the product package, or downloaded from Miranda's web site. As Kaleido-Alto does not incorporate a CD-ROM drive, it is necessary to install the software from a remote computer through a network connection. Installation of the software is detailed in a *"read me"* file included with the update.

4 Technical Specifications

4.1 Inputs

INPUTS	**Kaleido**	ALTO			QUAD	
	Model	HD	AD	A	HD	AD
Digital Video Input (HD-SDI)		**10**	**NA**	**NA**	**4**	**NA**
Signal: SMPTE 292M-C Cable Length: 100m (325') (Belden 1694) Return Loss 15dB up to 1.5Gbps Impedance: 75Ω Connector: BNC						
Digital Video Input (SD-SDI)		**10**	**10**	**NA**	**4**	**4**
Signal: 4:2:2 SMPTE 272M, 259M-C Cable Length: 225 m (Belden 1694A) Return Loss: 15dB up to 270 MHz Impedance: 75Ω Connector: BNC						
Composite Video Input		**10**	**10**	**10**	**4**	**4**
Signal: NTSC SMPTE 170M, PAL, PAL-M, SECAM, B&W Return Loss: 35dB up to 5.75MHz Quantization: 8 bits Impedance: 75Ω Connector: BNC						
DVI-D Input (High res)		**1**	**NA**	**NA**	**1**	**1**
Signal: Digital DVI Cable Length: 3.6 m (12') with Altinex CB4012DV Resolution: 800x600 to 1920X1080 w/56LB at 50/59.94 Hz *(see table XXX on page XXX for details)* Connector: DVI						
DVI-D Input (Limited res)		**NA**	**1**	**1**	**NA**	**NA**
Signal: Digital DVI Cable Length: 3.6 m (12') with Altinex CB4012DV Resolution: 800x600 to 1280X1024 at 50/59.94 Hz *(see table XXX on page XXX for details)* Connector: DVI						
HD Embedded Audio Input		**10**	**NA**	**NA**	**4**	**NA**
Signal: SMPTE-292M Bit Resolution: 20-24 bits Sampling Rate: 48 kHz synchronous						
SD Embedded Audio Input		**10**	**10**	**NA**	**4**	**4**
Signal: SMPTE-272M Bit Resolution: 20 bits Sampling Rate: 48 kHz synchronous						

.....continued

INPUTS (continued)	**Kaleido Model**	ALTO HD	ALTO AD	ALTO A	QUAD HD	QUAD AD
PC Audio		**1**	**1**	**1**	**1**	**1**
Signal:	Analog Stereo, source level adjustable					
Impedance:	16kΩ					
Max. level:	2V peak to peak					
Sampling Rate:	48 kHz free run					
Bit Resolution:	20 bits					
Connector:	Stereo audio jack 3.5 mm					

4.2 Outputs

OUTPUTS	**Kaleido Model**	ALTO HD	ALTO AD	ALTO A	QUAD HD	QUAD AD
RGBHV Progressive Output (High Res)		**1**	**NA**	**NA**	**1**	**1**
Resolution:	800x600 to 1920X1080 w/56LB at 50/59.94 Hz *(see table XXX on page XXX for details)*					
H Frequency:	From 31.4 kHz to 74.9 kHz					
V Frequency	50/59.94 Hz					
Level:	0.7 or 1.0 Vp-p (selectable software)					
Cable Length:	Short, Medium, Long					
Connector:	DE-15S					
RGBHV Progressive Output (Limited res)		**NA**	**1**	**1**	**NA**	**NA**
Resolution:	800x600 to 1280X1024 at 50/59.94 Hz *(see table XXX on page XXX for details)*					
H Frequency:	From 31.4 kHz to 74.9 kHz					
V Frequency	50/59.94 Hz					
Level:	0.7 or 1.0 Vp-p (selectable software)					
Cable Length:	Short, Medium, Long					
Connector:	DE-15S					
DVI-I Output (High res)		**1**	**NA**	**NA**	**1**	**1**
Signal:	Digital DVI					
Cable Length:	3.6 m (12') with Altinex CB4012DV					
Resolution:	800x600 to 1920X1080 w/56LB at 50/59.94 Hz *(see table XXX on page XXX for details)*					
Connector:	DVI					
DVI-I Output (limited res)		**1**	**NA**	**NA**	**1**	**1**
Signal:	Digital DVI					
Cable Length:	3.6 m (12') with Altinex CB4012DV					
Resolution:	800x600 to 1280X1024 at 50/59.94 Hz *(see table XXX on page XXX for details)*					
Connector:	DVI					

.....continued

OUTPUTS (continued)	**Kaleido Model**	ALTO			QUAD	
		HD	AD	A	HD	AD
AES Audio Output		**1**	**1**	**1**	**1**	**1**
Signal:	AES3					
Quantization	20 bits					
Impedance	110Ω					
Attenuation	Minimum level 0 dBFs (step 6 dBFs)					
Sampling Rate:	48 KHz					
Connector:	DE-15S					
Analog Stereo Audio Output		**1**	**1**	**1**	**1**	**1**
Signal:	1 stereo balanced ouput					
Quantization	20 bits (minimum)					
Impedance	<50Ω					
Level:	+24 dBu, adjustable level (step 6 dBu)					
SNR	98dB (A weighthing) up to 20-22kHz					
THD+N	80dB @ 1kHz					
Frequency Response:	+/- 0.3dB					
Connector:	DE-15S					

4.3 Control

CONTROL	**All models**
GPI Inputs	
Contact Closure:	GND
Total cable length:	200’
Minimum pulse duration:	100 ms
Connector:	DB-44S
GPI Outputs	
Max. Voltage:	12 VDC differential voltage
Cable Length:	100 ms
Connector:	DB-44S
RS-232	
Signal:	RS-232 (EIA/TIA-232)
Baud Rate:	9600 BPS, according to application
Connector:	DE-9P
RS-422 A	
Signal:	RS-422 (SMPTE 207M, EBU-3245) (a 12V power supply on pin 5 is provided for the Kaleido-RCP)
Data Rate:	38400 BPS, according to application
Connector:	DE-9S

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CONTROL (continued)	**All Models**
RS-422 B	
Signal:	RS-422 (SMPTE 207M, EBU-3245)
Data Rate:	38400 BPS, according to application
Connector:	DE-9S
Ethernet	
Signal:	10 BASE-T, 100BASE-T (IEEE 802.3)
Connector:	RJ-45
USB	
Signal:	USB ver. 1.0
Connector:	USB double type receptacle A

4.4 Processing Performance

PROCESSING PERFORMANCE	**All models**
Signal Path:	8 bits
Quantization:	24 bits on RGBVH output
Graphic:	18 bits on RGB

4.5 Frame

FRAME	
Kaleido-Alto AD/A	
Voltage:	100-240 VAC
Power:	90 W
Dimensions:	1 RU X 13.75 in (350 mm)
Weight	8.1lbs (3.7 kg)
Operating temperature:	0-40° C
Kaleido-Alto HD, Kaleido-QUAD HD/AD	
Voltage:	100-240 VAC
Power:	110 W (**Kaleido-Alto HD)**
Power:	50 W (**Kaleido-QUAD HD/AD)**
Dimensions:	1 RU X 19.25 in (490mm)
Weight	10lbs (4.5 kg)
Operating temperature:	0-40° C DB-44S

Annex – Kaleido display resolution

The Kaleido-Alto/Quad displays all the elements of its layout in a frame whose maximum vertical resolution is 1024 pixels. However, the RGBHV output from all versions of the Kaleido-Alto and the Kaleido-Quad can drive displays with greater vertical resolution, provided they are equipped with an appropriate hardware version (see the chart below). In particular, displays operating at 1920x1080 and 1600x1200 can be used with these Kaleidos.

1600 x 1200 resolution:
To drive a 1600x1200 display from Kaleido, the Kaleido layout must be created at 1600x1024 pixels. In KEdit, you must generate a 25 x 16 display aspect ratio. When this layout is shown on the display, 88 lines on top and bottom will be displayed in black.

1920 x 1080 resolution:
To drive a 1920x1080 display from Kaleido, the Kaleido layout must be created at 1920x1024 pixels. In KEdit, you must generate a 15 x 8 display aspect ratio. When this layout is shown on the display, 28 lines on top and bottom will be displayed in black (see figure A1).

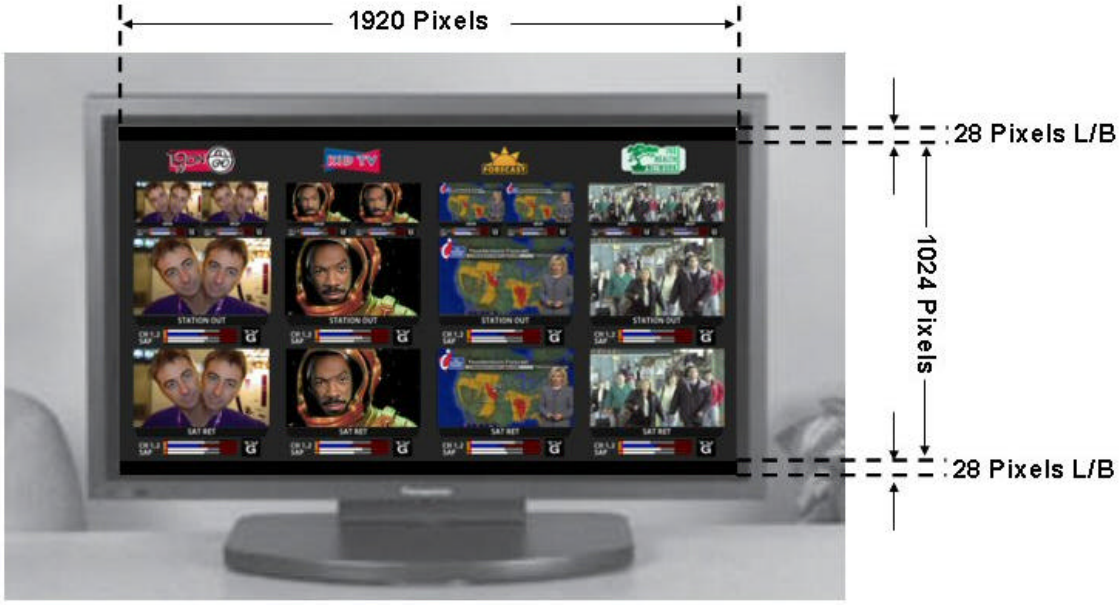

Figure A1: *Kaleido-Alto output on a 1920x1080 display showing black bars top and bottom*

A feature of Kaleido-Alto/Quad is the ability to replace the internally-generated background in the layout with images from an external source, via the DVI input. In this case, it is appropriate to select a DVI background source to match the display in use, i.e. 1600x1200 or 1920x1080. The background will occupy the entire display screen, and the Kaleido-generated elements will be keyed into the vertically-centered 1024-line portion of the screen, with no visible indication of any boundaries within the image (see figure A2).

Three sets of alternative “color keys” can be used by the background application. For example, in the case of integration with iControl WEB, the background uses (255 blue, 255 green and 0 red).

Figure A2: *Kaleido-Quad output on a 1920x1080 display showing the DVI background occupying the entire display with the Kaleido layout elements keyed in.*

Higher-resolution output support

Here is a chart of Kaleido Alto/Quad models and hardware revisions that will support output at 1920x1080 and 1600x1200 resolution:

Kaleido Models	**Hardware revision:** **200 = v200 base version** **200* = v200 enhanced version**	**Resolution higher than 1024 lines (i.e. 1920 x 1080 and 1600 x 1200) displayed in letter box format)**
Kaleido-Alto A	100 - 200	**Not Supported**
	200*	Supported
Kaleido-Alto D	100 - 200	**Not Supported**
	200*	Supported
Kaleido-Alto AD	100 - 200	**Not Supported**
	200*	Supported
Kaleido-Alto A2	300 and higher	Supported
Kaleido-Alto AD2	300 and higher	Supported
Kaleido-Alto HD	300 and higher	Supported
Kaleido-Quad HD	300 and higher	Supported
Kaleido-Quad AD	300 and higher	Supported