DUA II

Audio Interface

User Manual

Version: DOC-1.2 (May 2001)

Table of Contents

IMPORTANT NOTICE:

Please read the following information very carefully before attempting any installation. Failure to comply with the precise instructions may result in damage to your Merging hardware. Please read this entire section of the manual carefully before installation.

STATIC DANGER NOTICE:

Please note that the DUA II Audio Interface contains delicate electronic components that can be damaged or even destroyed when exposed to static electricity. Please take all of the necessary precautions when handling the DUA II with the cover removed. This notice also applies when performing a Firmware Upgrade. Take all necessary precautions not to discharge static electricity when touching any of the DUA II Internals.

INFORMATION FOR THE USER:

This device complies with part 15 of FCC rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesired operation.
This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed for providing reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions contained in this manual, may cause harmful interference to radio and television communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio and television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and the receiver
- Connect the equipment into an outlet on a circuit different from that of the receiver
- Consult the dealer or an experienced audio television technician

NOTE: Connecting this device to peripheral devices that do not comply with CLASS A requirements or using an unshielded peripheral data cable could also result in harmful interference to radio or television reception. The user is cautioned that any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment. To ensure that the use of this product does not contribute to interference, it is necessary to use shielded I/O cables.

EMC:
The DUA II complies with the following specifications:
CENELEC EN 55103-1
CENELEC EN 55103-2 (E4 Environment)

Contacting Merging

For all general or sales inquiries:

In Europe, contact our Swiss Office:
Tel: +41-21-946 0444 or Fax +41-21-946 0445

In the U.S., contact our Illinois Office:
Tel: +1-847-272-0500 or Fax: +1-847- 272-0597

All documentation inquiries, bug reports or suggestions for improvement can be directed to: info@merging.com

DUA II Warranty Information

This product is warranted to be free of defects in materials and workmanship for a period of one year from the date of purchase. This Limited Warranty is extended by Merging Technologies, Inc. to the original purchaser.
In the event of a defect or failure to confirm to this Limited warranty, Merging Technologies, Inc. will repair or replace the product without charge within sixty (60) days. In order to make a claim under this limited warranty; the purchaser must notify Merging Technologies, Inc. or their representative in writing, of the product failure. In this limited warranty the customer must upon Merging Technologies, Inc. request, return the product to the place of purchase, or other local designation, for the necessary repairs to be performed. If the consumer is not satisfied with the repair, Merging Technologies, Inc. will have the option to either attempt a further repair, or refund the purchase price.
This warranty does not cover: (1) Products which have been subject to misuse, abuse, accident, physical damage, neglect, exposure to fire, water or excessive changes in the climate or temperature, or operation outside maximum rating. (2) Products on which warranty stickers or product serial numbers have been removed, altered or rendered illegible. (3) The cost of installations, removal or reinstallation. (4) Damages caused to any other products.

Chapter 1 – Introduction

Congratulations on your DUA II purchase. The DUA II is the smartest audio interface solution for Pyramix users, SOFTIMAGE®|DS users and audio professionals, designed for supporting a surround monitoring system.

Features include:

- In a single unit, using industry standard audio connections:

  4 CH analog line inputs,
  4 CH analog line outputs,
  2 CH analog line outputs + headphones connector for monitoring,
  4 CH AES/EBU inputs,
  4 CH AES/EBU outputs.

- The signals from the inputs are also fed to the optical lightpipes in ADAT compatible format. This allows a direct connection to ADAT compatible multitrack devices and other devices such as digital consoles. These optical lightpipe connectors support up to 8 channels of 24 bit digital audio on one single optical fiber with no risk at all of line hum or any other electromagnetic interference.

- Rugged internal power supply. This unit accepts both 110 and 220 voltages for worldwide use.

- All audio connections are made using high quality balanced XLR type connectors.

- Clear and easy to use front panel controls.

- High quality 24 bit A/D and D/A using the latest generation in converter technology.

- High common mode rejection balanced input circuitry on all analog input for optimum rejection of power line hum, RF interference, voltage drops and other externally generated noise commonly encountered with long audio cable runs.

- All analog balanced output circuitry incorporates the advanced "Twin Servo Drive" output stage for maximum output signal balance ratio performance, even under adverse asymmetrical loads.

- Fits into standard 1 unit 19” rack.

- Local control from the front panel (in stand-alone mode).

- Remote control from Pyramix Virtual Studio software.

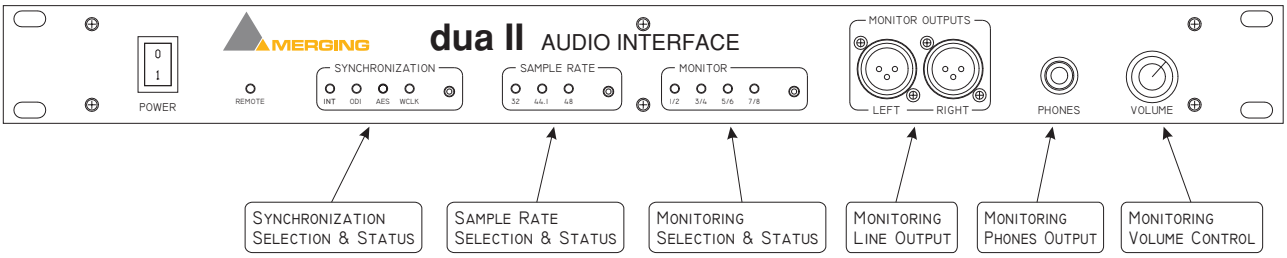
- Selectable stereo monitoring of all 8 inputs and outputs.

- Very comprehensive choice of synchronization sources.

- Very low jitter and calibrated internal clock.

- Fully tested for CE compliance for guaranteed safety and stability.

Chapter 2 – The Front Panel



Synchronization Selector and Status

The DUA II can operate in many different synchronization modes. It can synchronize to its internal clock or to a wide range of industry standard external sources. Pressing the *SYNCHRONIZATION* button allows the selection of the desired synchronization mode.

Possible Synchronization modes

- **INT**: DUA II synchronizes and locks to its internal clock.

- **ODI: (Default)** DUA II synchronizes to the optical input (ADAT). If no valid sync signal is present at the optical input (when the ODI mode is selected), the ODI LED will light on RED. Once a valid sync signal has been detected, the ODI LED will light on GREEN. If the sample rate of the DUA II and the ADAT signal are identical, the selected sample rate LED will light on GREEN. The DUA II is now locked and synchronized to the incoming ADAT signal.

- **AES**: DUA II synchronizes to an AES/EBU signal.
  There are 4 AES/EBU sync modes. You can see which mode is selected by pressing the *SYNCHRONIZATION* button for more than 1 second. The mode is then displayed in GREEN on RED background on the monitor LEDs as follow:

MON LED	AES/EBU sync mode
MON 1/2	**AUTO DETECT**
MON 3/4	AES/EBU Ref. Input
MON 5/6	AES/EBU 5/6 Input
MON 7/8	AES/EBU 7/8 Input

  While in AUTO mode, the DUA II automatically detects and switches to a valid AES/EBU sync source.
  In this mode, the LED *MON 1/2* is light on GREEN, indicating the AUTO mode, and the automatically selected input is indicated on the other MON LEDS in GREEN as well.
  Press the *MONITOR* button to change the AES/EBU sync source mode.
  Press the *SYNCHRONIZATION* button to save changes and return to the normal operation mode.

  If no valid sync signal is present at the selected AES/EBU input (when the AES mode is selected), the AES LED will light on RED. Once a valid AES sync signal has been detected, the AES LED will light on GREEN. If the sample rate of the DUA II and the AES signal are identical, the selected sample rate LED will light on GREEN. The DUA II is now locked and synchronized to the incoming AES signal.

- **WCLK**: DUA II synchronizes to a Word-Clock signal (TTL or CMOS level square wave at the sample rate selected on the front panel). If no valid sync signal is present at the Word-Clock input (when the WCLK mode is selected), the WCLK LED will light on RED. Once a valid sync signal has been detected, the WCLK LED will light on GREEN. If the sample rate of the DUA II and the Word-Clock signal are identical, the selected sample rate LED will light on GREEN. The DUA II is now locked and synchronized to the incoming Word-Clock signal.

Sample Rate Selector

DUA II supports 3 sample rates: 32 KHz , 44.1 KHz and 48 KHz.
The desired sample rate is selected by pressing the *SAMPLE RATE* button.

The sample rate is displayed in GREEN if DUA II is in internal or locked on the selected synchronization source.
The sample rate is displayed in RED if DUA II cannot lock on the selected synchronization source.

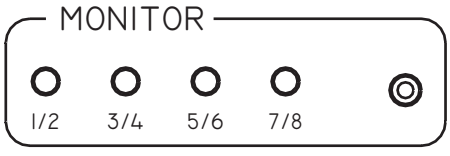
AutoDetect SR mode

By pressing the *SAMPLE RATE* button for 1 second, you enable the AutoDetect mode for the sample rate selection.
In this mode, the DUA II detects automatically the sample rate of the selected synchronization source.

While scanning the different sample rates, all 3 SR LEDs are light on RED.
When DUA II has found the sample rate of the selected synchronization source and is locked on it, the detected sample rate LED light on GREEN.

When in sync mode **INT:**
In Normal ADAT mode, the DUA II selects the sample rate based on the ADAT signal returning from the device connected and locked on DUA II.
In Stand Alone mode, the DUA II selects the sample rate based on the AES/EBU signal returning from the device connected and locked on DUA II.

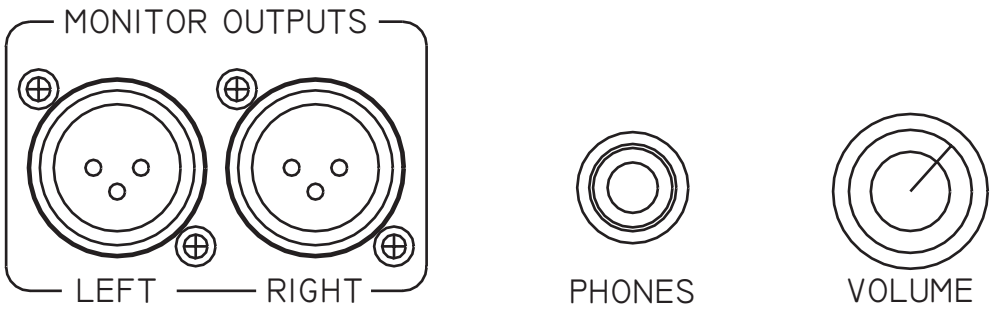
Monitoring Selector



This section allows for the Selection of any of the 8 input or output audio signals in pairs. The desired monitoring source is selected by pressing the *MONITOR* button.

The monitoring source selected is displayed in RED for inputs (RECORD), or GREEN for outputs (PLAYBACK).

Monitoring Outputs



Any professional level balanced audio input can be connected to the analog line monitor outputs of the DUA II.
4 output levels are selectable from consumer level (–10 dBV) up to professional level (+4 dBu).
See chapter 4 on how to configure the *Analog Outputs Level*.

The monitor outputs are also available on a stereo ¼ inch Jack connector with the volume control for a headphone.
Note: The volume control only impacts on the headphone monitoring, not on the XLR line outputs.

Power Switch & Remote indicator

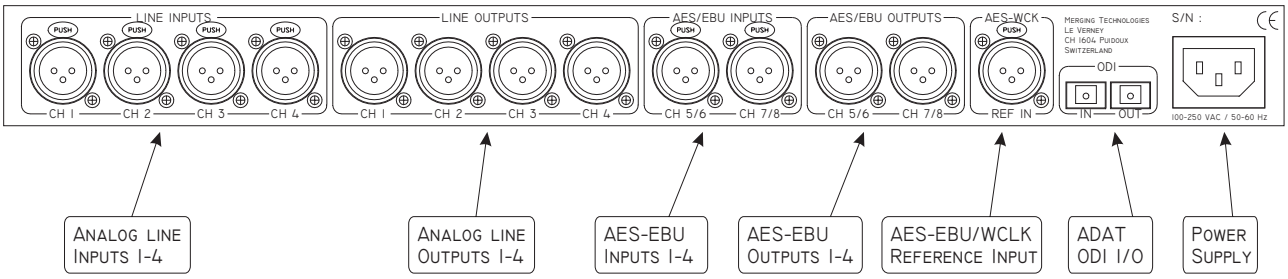
The *POWER* switch toggles the power source on and off.

The *REMOTE* LED type indicator indicates whether the DUA II unit is in remote or local control.

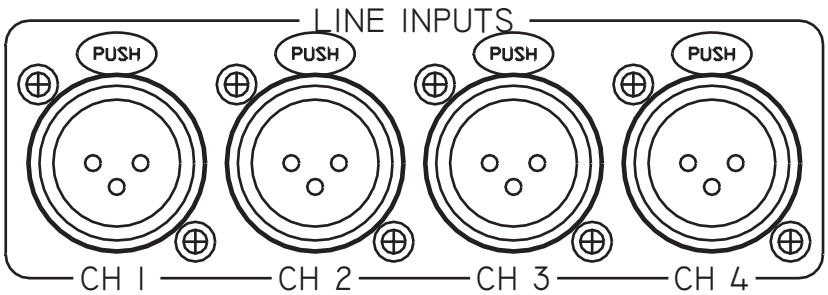
It displays also an error status:

- If the LED is not lit, the DUA II is ready in local control mode.
- If the LED is lit on GREEN, the DUA II is ready in remote control. In this mode, the DUA II front panel controls are being controlled via a software application (such as the Merging Pyramix Workstation).
- If the LED is lit on RED, the DUA II is not ready. The LED lights on RED at power-up for less than 1 second. If the LED still light on RED ~1 second after power up, it means that DUA II is not working properly.

Chapter 3 – The Back Panel

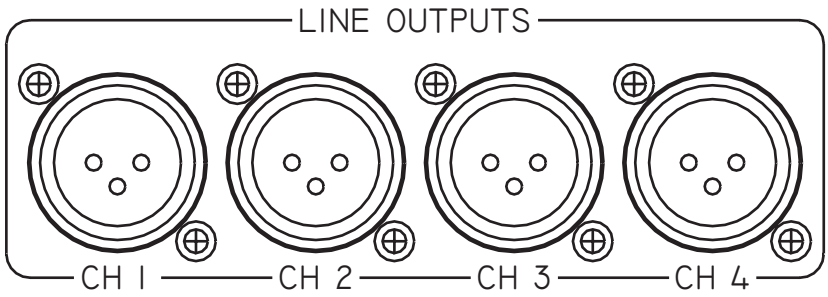


Analog Line Inputs 1-4



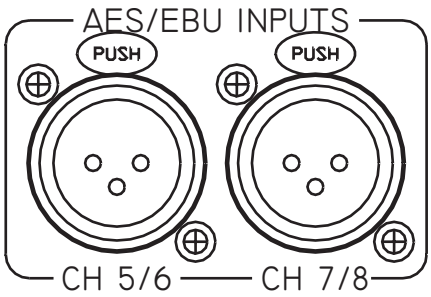
Any professional level balanced audio outputs sources can be connected to the analog line inputs of the DUA II.
4 input levels are selectable from consumer level (–10 dBV) up to professional level (+4 dBu).
See chapter 4 on how to select the *Analog Inputs Level*.
The analog line inputs 1-4 are routed to the ADAT output channels 1-4.

Analog Line Outputs 1-4



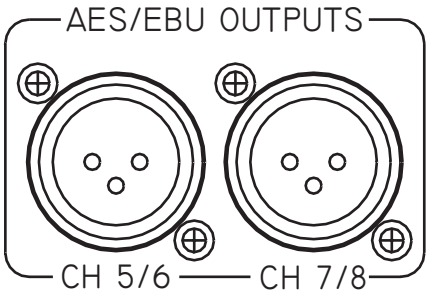
Any professional level balanced audio input sources can be connected to the analog line outputs of the DUA II.
4 output levels are selectable from consumer level (–10 dBV) up to professional level (+4 dBu).
See chapter 4 on how to select the *Analog Outputs Level*.
The analog line outputs 1-4 can be configured to output the ADAT input channels 1-4 or 5-8.
See chapter 4 on how to configure the *Analog Outputs Routing*.

AES/EBU Inputs 5-8



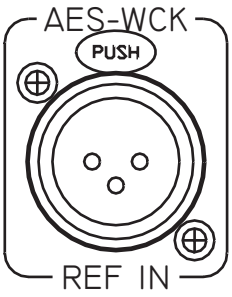
Any professional level balanced digital AES/EBU audio output sources at 32, 44.1 or 48 KHz can be connected to the AES/EBU inputs of the DUA II.
The AES/EBU inputs 5-8 are routed to the ADAT output channels 5-8.

AES/EBU Outputs 5-8



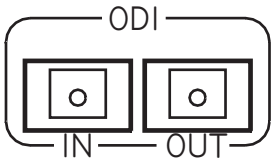
Any professional level balanced digital AES/EBU audio inputs at 32, 44.1 or 48 KHz can be connected to the AES/EBU outputs of the DUA II.
The AES/EBU outputs 5-8 can be configured to output the ADAT input channels 1-4 or 5-8.
See Chapter 4 on how to configure the *Digital Outputs Routing*.

AES/EBU / Word-Clock Reference Input



This XLR type connector has two functions. It can accept an AES/EBU sync reference or any Word-Clock signals. When the DUA II is set to AES synchronization mode, it will resolve the DUA II clock to the AES/EBU sync signal present here. When DUA II is set to Word-Clock synchronization mode, it will sync the DUA II clock to the Word-Clock signal present here.

ODI (Optical Digital Interface)



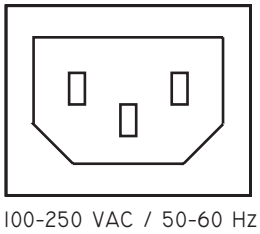
ODI IN

This EIAJ optical connector receives channels 1-8 of any ADAT compatible output.

ODI OUT

This EIAJ optical connector transmits channels 1-8 to any ADAT compatible input.

Power Connector



DUA II uses universal power supply that accepts AC from 100 to 250 volts. It is designed for being connected to an outlet that includes three pins (center pin to ground). The ground connection is an important safety feature designed for keeping potentially dangerous voltages away from the chassis. Never defeat the ground safety feature.

Never operate the DUA II with ungrounded outlets. Plugging the DUA II into an ungrounded outlet, or defeating the ground pin, can create a potentially hazardous condition. Merging Technologies cannot be held responsible for problems caused to DUA II or any associated equipment with improper AC connections.

Chapter 4 – DIP Switch Settings

The DUA II contains a DIP switch which provides some extended configuration capabilities.
The DIP switch is accessible on the right side of the DUA II (looking from the front panel).

SW 1-2	Full Scale Analog Inputs Level
OFF-OFF	+ 6 dBu (note 1)
OFF-ON	+ 12 dBu
ON-OFF	**+ 18 dBu (note 2)**
ON-ON	+ 24 dBu

SW 3-4	Full Scale Analog Outputs Level
OFF–OFF	+ 6 dBu (note 1)
OFF–ON	+ 12 dBu
ON-OFF	**+ 18 dBu (note 2)**
ON-ON	+ 24 dBu

SW 5	Analog Outputs Routing
OFF	**Analog Outputs on CH 1-4**
ON	Analog Outputs on CH 5-8

SW 6	Digital Outputs Routing
OFF	AES/EBU Outputs on CH 1-4
ON	**AES/EBU Outputs on CH 5-8**

SW 7	ADAT Mode
OFF	**Normal ADAT mode** (note 3)
ON	Stand Alone Mode (note 4)

SW 8	Crystals Calibration
OFF	**Normal mode**
ON	Crystals Calibration mode

Default Factory settings are in **bold**.

Note 1: correspond to a -10 dBV nominal level, with headroom of 14 dB.

Note 2: correspond to a +4 dBu nominal level, with headroom of 14 dB.

Note 3: Normal ADAT mode is the default: The audio flow in this mode is represented in Appendix 2.

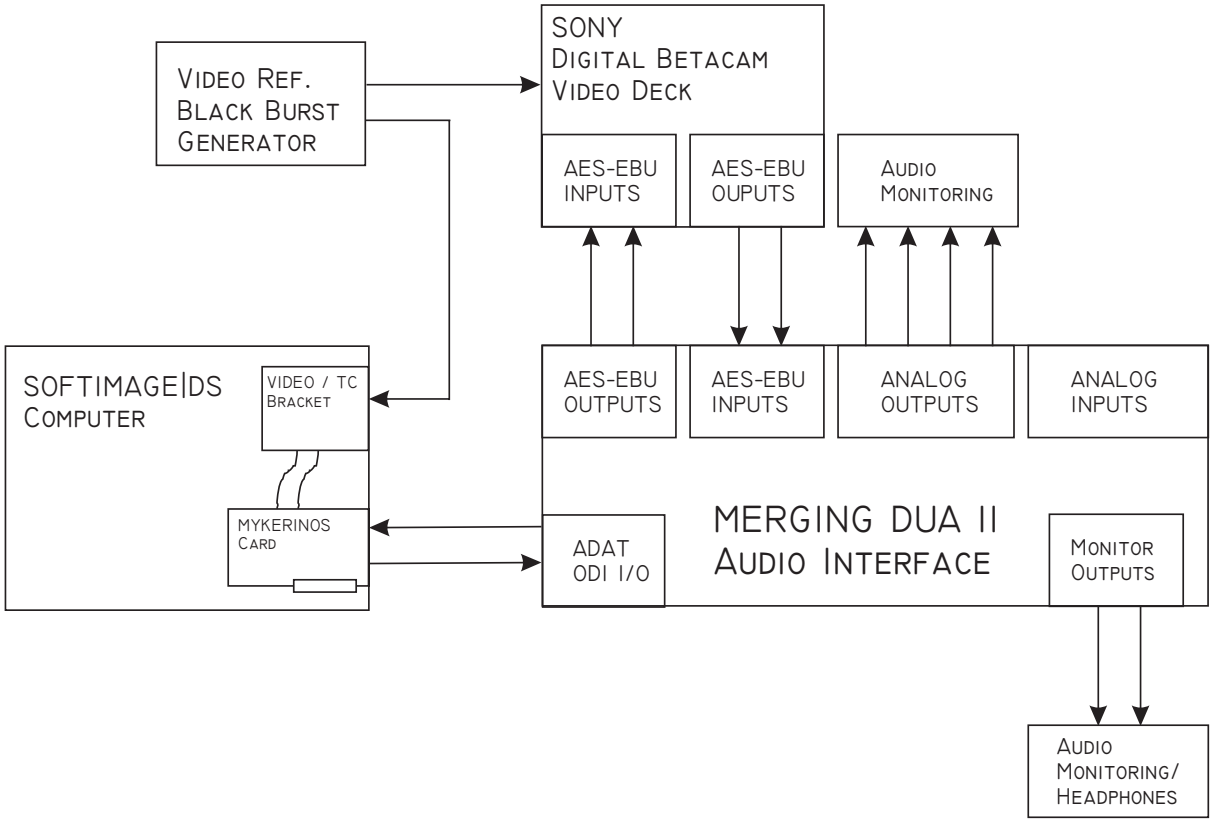
Note 4: Stand-Alone mode: This mode should be selected when no ADAT compatible device is used, such as A/D-to-AES/EBU and AES/EBU-to-D/A configuration.
In this mode, the ODI output is internally looped to the ODI input.
It is however possible to lock to an ADAT signal connected to the ODI input, but its audio content will be ignored. The ADAT formatted signal is present at the ODI output, as in the Normal mode.

Chapter 5 – Typical Audio Connections

This section will display some typical audio connection scenarios for DUA II.

SOFTIMAGE®|DS 3.0 with SONY Digital BetaCam Users

This example is based on Digital Studio users who are using the DUA II in conjunction with the Merging Mykerinos boards and a Digital Betacam video deck.

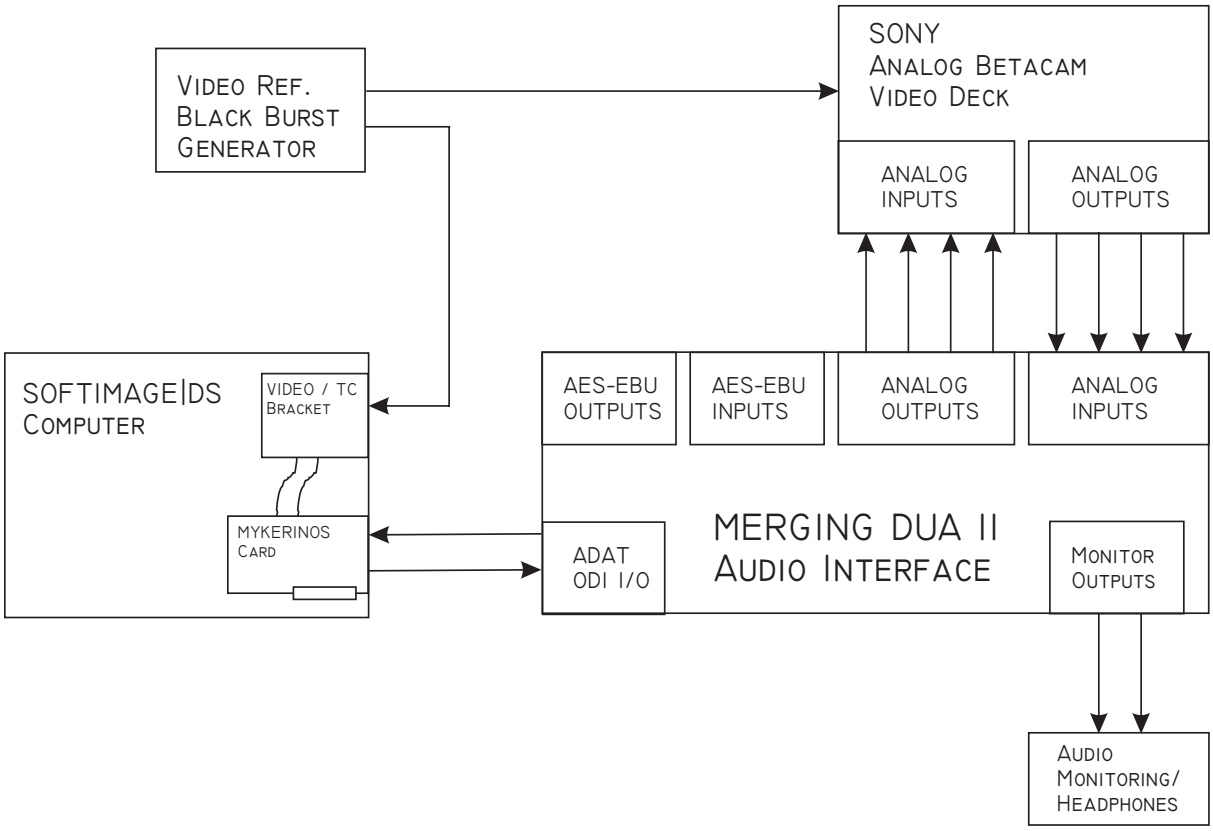


This example uses the following:

- Digital BetaCam outputs are routed through AES/EBU inputs of DUA II to DS input channels 1-4 (ADAT).
- DS output channels 1-4 (ADAT) are routed through AES/EBU outputs of DUA II to the Digital BetaCam inputs.
- DS output channels 1-4 (ADAT) are routed through analog outputs to the monitoring system.
  (Alternate monitoring is provided by the front panel monitoring selection of DUA II).
- The Mykerinos card (via VIDEO/TC bracket) and the Video Deck are connected to the Video Ref. generator.
  Note that each device should be connected to the video generator with its own cable.
  Using the Loop-Through to connect the different devices is not recommended.
- The DUA II is set to **ODI** sync mode and **AutoDetec SR** mode.
- The DIP switch 1-8 must be set to: **X – X – X – X – OFF – OFF – OFF – OFF.**

SOFTIMAGE®|DS 3.0 with SONY Analog BetaCam Users

This example is based on Digital Studio users who are using the DUA II in conjunction with the Merging Mykerinos boards and an Analog BetaCam video deck.

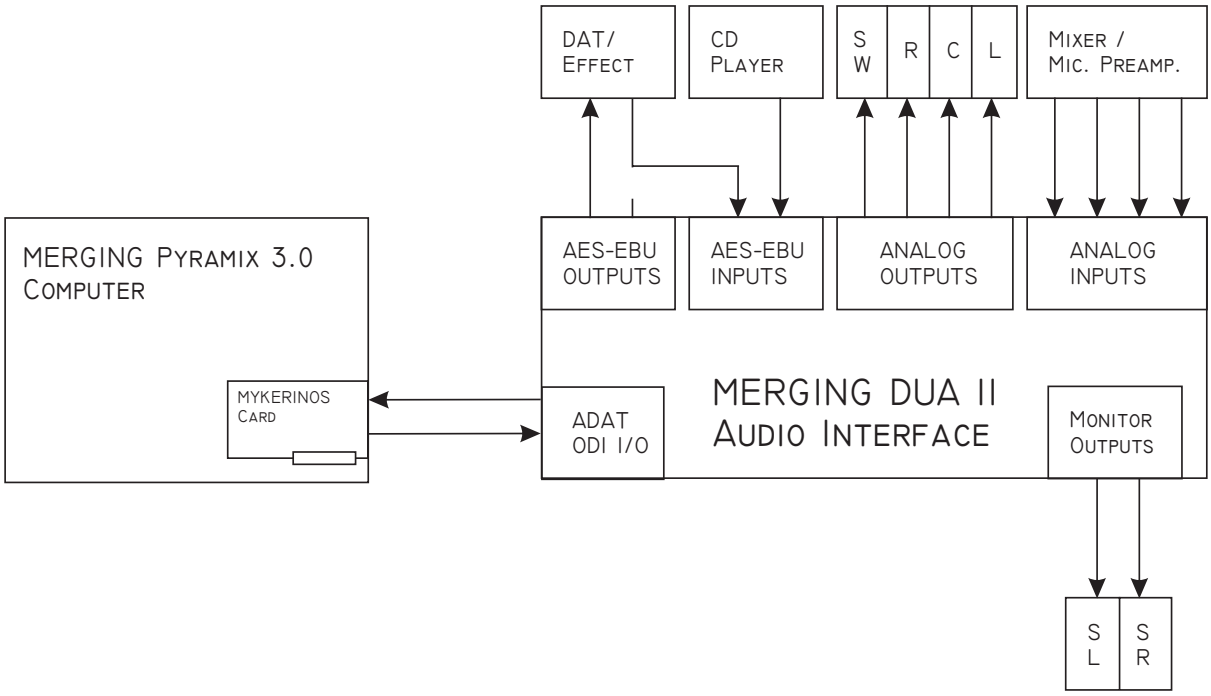


This example uses the following:

- Analog BetaCam outputs are routed through analog inputs of DUA II to DS input channels 1-4 (ADAT).
- DS output channels 1-4 (ADAT) are routed through analog outputs of DUA II to the Analog BetaCam inputs.
- The monitoring is provided by the front panel monitoring selection of DUA II.
- The Mykerinos card (via VIDEO/TC bracket) and the Video Deck are connected to the Video Ref. generator. Note that each device should be connected to the video generator with its own cable. Using the Loop-Through to connect the different devices is not recommended.
- The DUA II is set to **ODI** sync mode and **AutoDetec SR** mode.
- The DIP switch 1-8 must be set to: **X – X – X – X – OFF – OFF – OFF – OFF.**

Merging®|Pyramix 3.0 Workstation with Surround Monitoring Users

This example is based on a typical Pyramix analog/digital audio studio with both types of devices and a surround monitoring system.

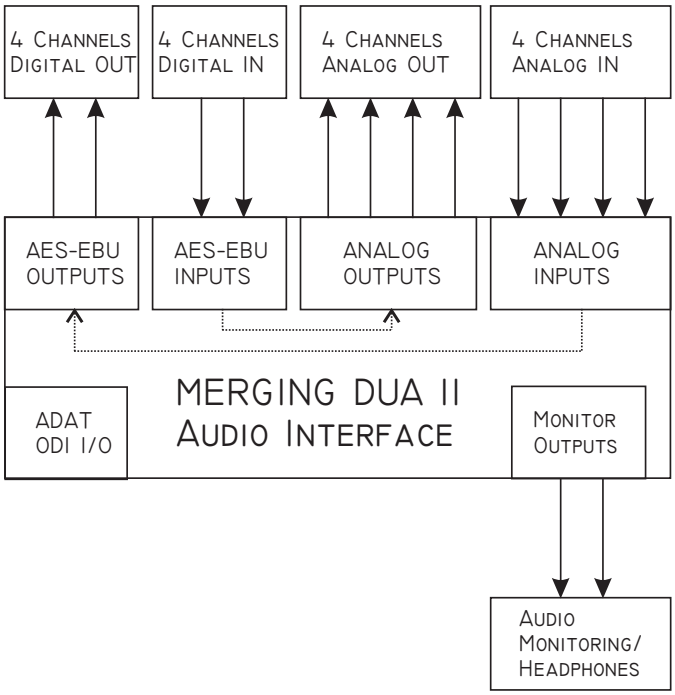


This example uses the following:

- Mic.Preamp./Mixer outputs are routed through analog inputs of DUA II to Pyramix input channels 1-4 (ADAT)
- DAT/Effect/CD-Player outputs are routed through AES/EBU inputs of DUA II to Pyramix input channels 5-8 (ADAT)
- Pyramix output channels 1-4 (ADAT) are routed through analog outputs of DUA II to the monitoring system. (In this example: CH1 = Left / CH2 = Center / CH3 = Right / CH4 = Subwoofer)
- Pyramix output channels 5-6 (ADAT) are routed through monitor outputs of DUA II to the monitoring system. (In this example: Left = Surround Left / Right = Surround Right)
- Pyramix output channels 7-8 (ADAT) are routed through AES/EBU outputs of DUA II to the DAT/Effect. (In this example: It may be a simple Stereo Mix to be recorded on DAT, or a send for external effect)
- The DAT/Effect must be synchronized to its AES/EBU input.
- The DUA II is set to **ODI** sync mode, **AutoDetec SR** mode and **OUT5/6** monitoring.
- The DIP switch 1-8 must be set to: **X – X – X – X – OFF – ON – OFF – OFF.**

Stand Alone A/D and D/A Setup

This example is based on a stand-alone audio converter application.
This configuration allows having 4 ANALOG-to-AES/EBU and 4 AES/EBU-to-ANALOG converters.



This example uses the following:

- Analog line inputs 1-4 are internally routed to AES/EBU outputs 5-8.
- AES/EBU inputs 5-8 are internally routed to analog line outputs.
- The monitoring is provided by the front panel monitor selection of DUA II.
- The DIP switch 1-8 must be set to: **X – X – X – X – ON – OFF – ON – OFF.**

Appendix 1 – Technical Specifications

Parameter	Conditions	Value	Unit
Dimensions	19" 1U height	W = 485 D = 250 H =43	mm
Weight		1	Kg
Power Consumption		10	VA
Internal Sampling Frequency Accuracy	25° Celsius	+/- 5	PPM
Internal Sampling Frequency Accuracy	0° to 50° Celsius	+/- 25	PPM
Internal Sampling Frequency Jitter	Measured on ODI output	< 2	ns p-p

Analog Line Inputs

Parameter	Conditions	Value	Unit
Resolution		24	Bits
Max. Sample Rate		48	KHz
Min. FS Input Level		+6	dBu
Max. FS Input Level		+24	dBu
Dynamic Range	A-weighted	106	dB(A)
	Unweighted	103	dB
THD+N	1 kHz @ -1 dBFS = 17 dBu	-98	dB
Frequency Response	20Hz-20kHz	± 0.1	dB
Input Impedance	Differential	>20	KOhms
Common Mode Rejection		>40	dB
Interchannel Isolation (Crosstalk)	1kHz	>100	dB

Analog Line Outputs

Parameter	Conditions	Value	Unit
Resolution		24	Bits
Max. Sample Rate		48	KHz
Min. FS Output Level		+6	dBu
Max. FS Output Level		+24	dBu
Dynamic Range	A-weighted	103	dB(A)
	Unweighted	100	dB
THD+N	1 kHz @ -1 dBFS = 17 dBu	-94	dB
Frequency Response	20Hz-20kHz	± 0.1	dB
Output Impedance	Differential	<50	Ohms
Output Balance Ratio		>40	dB
Interchannel Isolation (Crosstalk)	1kHz	>100	dB

AES/EBU Inputs

Parameter	Conditions	Value	Unit
Resolution		24	Bit
Max. Sample Rate		48	KHz
Input Impedance	Differential	110	Ohms

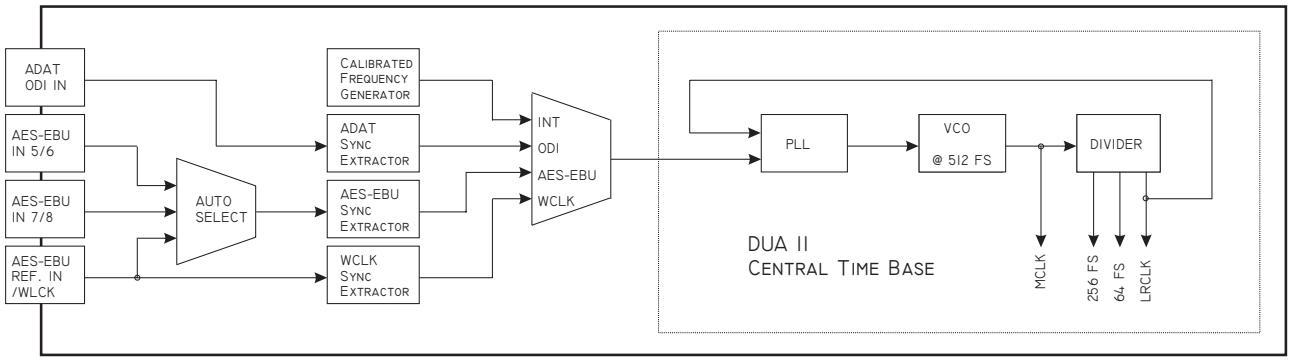
AES/EBU Outputs

Parameter	Conditions	Value	Unit
Resolution		24	Bit
Max. Sample Rate		48	KHz
Output Impedance	Differential	110	Ohms

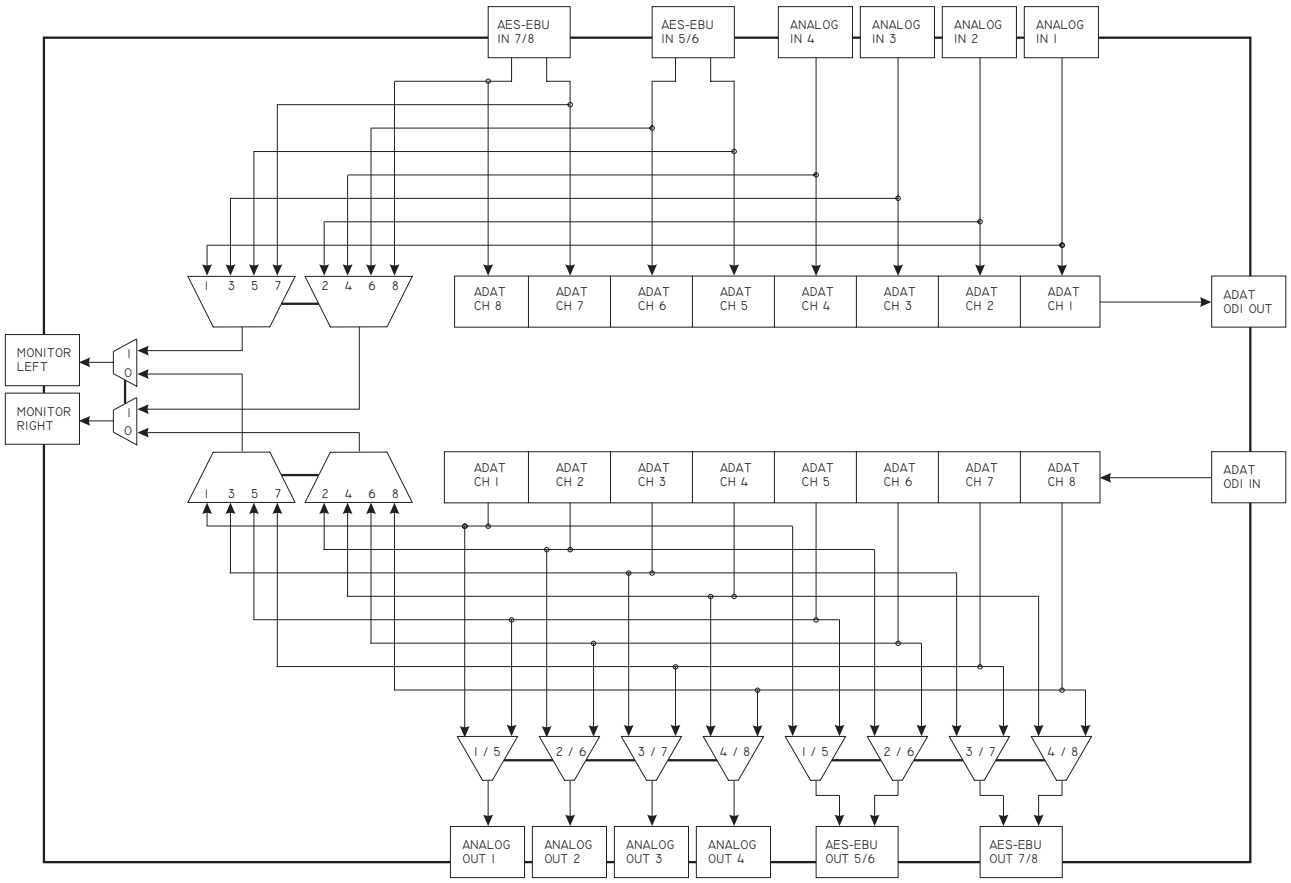
Note: All specifications subject to change without notice.

Appendix 2 – Flow Chart Diagrams

DUA II Synchronization Flow Chart



DUA II Audio Flow Chart



Appendix 3 – Upgrading the DUA II Firmware

All registered DUA II users will be contacted by Merging in the event of a DUA II firmware upgrade. This upgrade can be performed easily in the field. If you are unsure on how to perform this procedure, please contact Merging.

- Disconnect the power supply cable,
- Remove the top cover,
- Locate the Flash ROM chip (It is labeled with a sticker "V 1.0". This number may be different to reflect the firmware version currently installed in your DUA II unit),
- Using a small screwdriver, remove carefully the Flash ROM chip from its socket,
- Take the new Flash ROM chip and plug it in the socket (by hand), in place of the old one,
- Take care to ensure that the new Flash ROM chip is inserted in the same orientation as the previous chip,
- Replace the top cover.

Appendix 4 – Troubleshooting / FAQ

Monitor LED is constantly blinking:

This problem happens when the DUA II has detected the selected sync source as active but cannot lock to it.
In this situation, all inputs and outputs are muted.
The most common occurrence for this situation to happen is whenever the DUA II and the equipment to which it is connected are both set to slave to each other. This is a pretty common user setup problem. Care should be taken in any digital audio studio to always set one (and only one) unit as the master while programming all other units to slave to this "master" clock.

Note that while detecting the sample rate of the selected sync source, when set in AutoDetect SR mode, the DUA II mutes also all its inputs and outputs and so the monitor LED is blinking.

Monitor LED is constantly blinking when I select an output channel (GREEN):

This problem may happen when the signal present at the ODI input is not synchronous with the DUA II clock, or has too much jitter.
In this situation, all outputs are muted.
The most common occurrence for this situation to happen is whenever the DUA II and the equipment to which it is connected are both set to slave to each other. This is a pretty common user setup problem. Care should be taken in any digital audio studio to always set one (and only one) unit as the master while programming all other units to slave to this "master" clock.

Why does the sync LED light in RED when locking to incoming AES signals?

When set to AES sync mode with the AES LED light on RED, it indicates that no valid AES/EBU signal has been detected. It may be that there is no signal at all, or that this signal is not at the same sample rate than the DUA II.

Once a valid AES/EBU signal has been detected, the AES LED light on GREEN.
The LOCK LED should light on GREEN, to indicate that the DUA II is locked to the incoming signal.
If the LOCK LED still light on RED, this may be that the incoming signal sample rate is out of the DUA II crystal's range, or that this signal has too much jitter.

What would be a typical use of the AES/EBU reference input on the back of DUA II ?

Some studios are using an AES/EBU reference signal as a house-sync, instead of a Word-Clock or a video reference.

When using the DUA II as a stand-alone unit, how do you route audio through the unit? Can you do it without patching the ADAT INs and OUTs together?

When using the DUA II as a stand-alone unit, the DIP Switch 7 should be set to enable the STAND ALONE mode. This way all inputs are routed internally one-to-one to the outputs. There is no need for an ADAT external loop.

In a manner to use the DUA II as a stand alone 4 CH A/D and 4 CH D/A converter, you will also need to set DIP Switch 5 and clear the DIP Switch 6. With this configuration, DUA II routes signals as follow:

- Analog line signals on inputs 1 and 2 are converted to a digital AES/EBU signal on output 5/6,
- Analog line signals on inputs 3 and 4 are converted to a digital AES/EBU signal on output 7/8,
- Digital AES/EBU signal on input 5/6 is converted to two analog line signals on outputs 1 and 2,
- Digital AES/EBU signal on input 7/8 is converted to two analog line signals on outputs 3 and 4,

What is the best setup (again, stand-alone-no computer) for measuring and testing the audio coming out AES and Analog?

The configuration described above should be a pretty good example of how to setup DUA II for a stand-alone A/D and D/A quality measurement. This setup allows both a A/D path and a D/A path to be measured, using for example an Audio Precision equipment which can generate test tones in AES/EBU format, while analyzing the returned analog line signals or the opposite as well (generating analog line signals and analyzing returned digital AES/EBU signals)

I want to place the DUA II in a machine room, what is the maximum cable length I can use for the Optical cables?

When using Mykerinos and the DUA II for example, we have tested optical runs of up to 10 meters, using standard APF (All Plastic Fiber) cables without problems. The official maximum length recommended by Alesis (the makers of ADAT) is 6 meters.
Beyond 10 meters (and up to 1000 meters), the setup requires the addition of two Merging **Onouris** LDS (Long Distance System) converters.
Contact Merging if you would like to run optical cables longer than 10 meters.

Can you solve the optical cable distance by simply substituting glass optical cables for the plastic cables?

This is not a recommended practice. If you need length, only switching to glass optical cable is not enough.
You will need to change the optical 'driver' and 'receiver' as well.

Merging provides the whole system, composed of two glass optical cables and one **Onouris** LDS at each end.
This system allows a bi-directional link of up to 1000 meters.

Appendix 5 – Glossary of Terms

Here are some common audio terms used in this document.

ADAT

This is a multichannel optical digital interface. It is a proprietary standard, which is used in the family of Alesis ADAT digital multitrack recorders. The ADAT data stream contains 8-channels of digital audio data through a single fiber optic cable. ADAT is a registered trademark, property of Alesis Corp.

AES/EBU

AES/EBU is a serial transmission format standardized for professional digital audio signals A specification using time division multiplex for data, and balanced line drivers to transmit two channels of digital audio data on a single twisted-pair cable using 3-pin (XLR) connectors.

WCLK

WCLK (or Word-Clock) is a TTL-compatible square wave signal at a specific sample rate such as 48 kHz.