I R T Electronics Pty Ltd A.B.N. 35 000 832 575
26 Hotham Parade, ARTARMON N.S.W. 2064 AUSTRALIA
National: Phone: (02) 9489 3744 Fax: (02) 9439 7439
International: +61 2 9439 3744 +61 2 9439 7439
Email: sales@irtelectronics.com

IRT Eurocard

Types DAX-3200

Audio Extractor for 270 Mb/s SDI

Designed and manufactured in Australia

IRT can be found on the Internet at:
http://www.irtelectronics.com

IRT Eurocard

Type DAX-3200

Audio Extractor for 270 Mb/s SDI

Instruction Book

Table of Contents

This instruction book applies to units later than S/N 9800000.

General description

The DAX-3200 is intended as a high performance embedded audio extractor for 270 Mb/s SDI video signals.

A typical SDI signal may contain up to eight audio pairs arranged in four groups although only one pair is normally required for program distribution.

Each DAX-3200 is capable of extracting one audio pair from those available. Selection may be made by either remote or local control.

Regenerated SDI outputs are provided to allow connection of more modules if additional channels are required.

For special situations, an onboard link is provided which swaps the left and right channel outputs.

The DAX-3200 supports AES/EBU synchronous audio at 48 KHz, 20-bit audio data packets.

Both analogue and digital audio outputs are provided so that the one module may be used for all applications in monitoring and processing.

The use of digital audio filtering and 20-bit digital to analogue converters produce studio quality analogue audio and the AES/EBU digital interface allows digital interconnection in either balanced or unbalanced formats.

An audio presence indicator is provided for each output. If no audio is detected the corresponding output is muted.

The DAX-3200 complements the DVC-3111 SDI to analogue video converter for full conversion of SDI signals to analogue video and audio.

The DAX-3200 is fabricated in IRT's standard Eurocard format and may be housed in a variety of IRT Eurocard frames alongside other standard modules.

Standard features:

- **Standard 75 Ω 270 Mb/s video input.**
- **Extracts embedded audio.**
- **(Level A audio packet decoding).**
- **Supports 525 & 625 line standards.**
- **Indicators / external alarms for loss of carrier & audio.**
- **Automatic input equaliser to >250 m.**
- **Two 270 Mb/s outputs for loop through to additional units.**
- **Two high quality analogue audio outputs.**
- **110 Ω balanced & 75 Ω unbalanced AES/EBU output.**
- **IRT Eurocard format.**

Equipment provided:

Standard: DAX-3200 SDI audio extractor module.
-3200 Rear assembly

Accessories available:

FR-700 Eurocard module mounting frame	Mounts up to 12 Eurocard modules and one PT-700 Dual AC power supply side by side in 134 mm of standard rack space (3 Rack Units).
FRU-1030 1 RU chassis conversion/PSU	Converts Eurocards to a 1 rack unit format. The FRU-1030 can be fitted with either one or two Eurocards in a horizontal side by side format. A single AC power supply is included to power the cards.

TME-6 Eurocard extender board.

Instruction Book.

Technical specifications
IRT Eurocard module
Type DAX-3200

SDI input:

Number	1 (BNC).
Impedance	75Ω terminated.
Equalisation	Automatic for cables lengths <250 m (Belden 8281).
Format	270 Mb/s video with embedded audio serial data to SMPTE 259M-C.

SDI outputs:

Number	2 (BNC).
Type	75Ω sourced.
Format	Regenerated and re-clocked.

Analogue outputs:

Impedance (balanced)	66 Ω.
Output level	0 dBFS = +24 dBu.
SNR unweighted	-90 dBFS.
Frequency response	0.5 dB (20 Hz to 20 KHz).
THD	0.05 % *
IMD	0.05 % SMPTE at +4 dBu.
Crosstalk between channels	95 dB.

* 20 Hz to 20 KHz at 0 dBFS.

AES/EBU outputs:

Balanced outputs:

Output impedance	110 Ω.
Signal amplitude	5 V ±1 Vp-p.
Balance	> 30 dB (DC to 6 MHz).
Rise and fall times	10 ns typical.
Data jitter	<± 20 ns.

Unbalanced outputs:

Output impedance	75 Ω unbalanced.
Signal amplitude	0.5 Vp-p ± 20%.
Rise and fall times	10 ns typical.
Data jitter	<± 20 ns.

Other:

Power requirements		28 Vac CT (14-0-14) or ± 16 Vdc.
Power consumption		<7 VA.
Temperature range		0 - 50° C ambient.
Connectors		Phoenix plug in terminal blocks unless otherwise noted.
Mechanical		Suitable for mounting in IRT 19" rack chassis with input, output and power connections on the rear panel.
Finish:	Front panel	Grey enamel, silk-screened black lettering & red IRT logo.
	Rear assembly	Detachable silk-screened PCB with direct mount connectors to Eurocard and external signals.
Dimensions		30 mm x 3 U x 220 mm IRT Eurocard.
Accessories supplied with module		Rear connector assembly including matching connectors for audio, alarms and controls.
Optional accessories		TME-6 module extender card.

Due to our policy of continuing development, these specifications are subject to change without notice.

Internal adjustments

The following adjustable resistors are factory set and should not be adjusted unless a component has been replaced. They are not 'operational' controls. Before adjusting any of these controls, allow time for the module to reach temperature stability.

RV 3 Analogue output gain calibration

Configuration

Links:

Link	Normal	Function
LK 1	IN:	Remote address select A1
LK 2	2a:	Alarm out – a: open collector b: open emitter
LK 3	Not fitted.	
LK 4	IN:	Remote address select A2
LK 5	IN:	Remote address select A0
LK 6	OUT:	No de-emphasis IN: 48 KHz de-emphasis.
LK 7	OUT:	Factory use – do not change.
LK 8	OUT:	Factory use – do not change.
LK 9	OUT:	Factory use – do not change.
LK 10	OUT:	Factory use – do not change.
LK 11	Not fitted.	
LK 12	OUT:	Factory use – do not change.
LK 13	OUT:	Factory use – do not change.
LK 14	OUT:	Factory use – do not change.
LK 15	OUT:	Factory use – do not change.

Operational safety

WARNING

Operation of electronic equipment involves the use of voltages and currents that may be dangerous to human life. Note that under certain conditions dangerous potentials may exist in some circuits when power controls are in the **OFF** position. Maintenance personnel should observe all safety regulations.

Do not make any adjustments inside equipment with power **ON** unless proper precautions are observed. All internal adjustments should only be made by suitably qualified personnel. All operational adjustments are available externally without the need for removing covers or use of extender cards.

Pre-installation:

Handling:

This equipment may contain or be connected to static sensitive devices and proper static free handling precautions should be observed.

Where individual circuit cards are stored, they should be placed in antistatic bags. Proper antistatic procedures should be followed when inserting or removing cards from these bags.

Power:

AC mains supply: Ensure that operating voltage of unit and local supply voltage match and that correct rating fuse is installed for local supply.

DC supply: Ensure that the correct polarity is observed and that DC supply voltage is maintained within the operating range specified.

Earthing:

The earth path is dependent on the type of frame selected. In every case particular care should be taken to ensure that the frame is connected to earth for safety reasons. See frame manual for details.

Signal earth: For safety reasons a connection is made between signal earth and chassis earth. No attempt should be made to break this connection.

Installation in frame or chassis:

See details in separate manual for selected frame type.

Connections:

Controls

- Group select (1,2,3 or 4)
- Channel pair select (1&2 or 3&4)

Indicators and alarms
The alarm output on the rear of the DAX-3200 indicates a loss of 270 Mb/s data. This alarm output is an NPN transistor with links on the PCB to allow either open collector or open emitter output configurations.

LED's on the front panel indicate:

Loss of carrier
Audio present
DC power

SDI Video:

Input:
The SDI input is a single BNC connector terminated in 75 Ohms (SK 1).
The input equaliser compensates automatically for losses of up to 250 metres of high quality 75 Ohm coaxial cable. Performance tests are made using Belden 8281 cable as a reference. Actual results and bit error rates will depend on the quality of the cable and the noise environment as well as the quality of the originating equipment.

Outputs:
Two SDI outputs are provided, BNC connectors SK2 & 3. These are equalised and reclocked outputs and so will exhibit a small time delay with respect to the input. This may need to be taken into account if they are to be used for other than monitoring purposes.
These outputs are matched 75 Ohm impedance and should only be used with 75 Ohm coaxial cable. They must be 75 Ohm terminated at the destination in order to obtain correct levels and performance.

AES Audio:

AES audio outputs are provided in both unbalanced and balanced formats. The AES signal is encoded as stereo and therefore does not require separate connections for 'Left' and 'Right' channels.

The unbalanced BNC output connector (SK 6) should only be used with 75 Ohm coaxial cable and must be 75 Ohm terminated at the destination in order to obtain correct levels and performance.

The balanced output (J 5) should be used with high quality twisted pair shielded cable and terminated in a balanced configuration of 110 Ohms at the destination. This format is not polarity (phase) conscious, but +ve and -ve marks are provided beside the output connector for consistency in wiring. However, it is important that the cable lengths and losses of the pair be the same. In particular, patch bays can introduce these problems, resulting in distorted eye patterns and thus, high bit error rates.

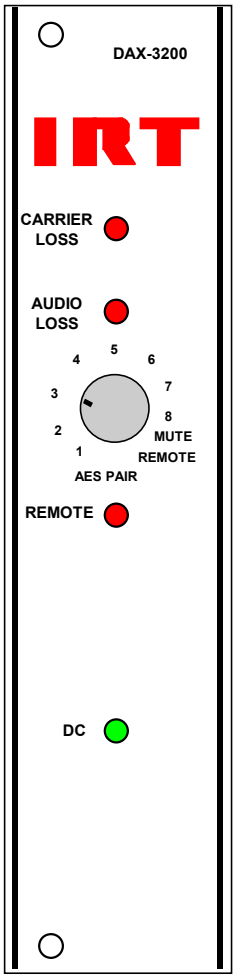
This format is not generally suited to long cable runs. For these applications the unbalanced 75 Ohm output should be used.

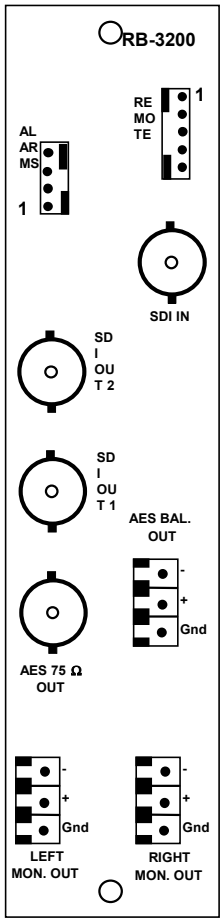
Analogue Audio:

Balanced analogue 'Left' and 'Right' audio outputs are provided (J 6 & 7). These are low impedance and may be connected to either 600 Ohm or high impedance balanced inputs.
It is essential that relative phasing of 'Left' and 'Right' channels is maintained and +ve and –ve markings are provided next to the connectors to facilitate correct connection. These connectors are polarised to ensure correct orientation.

Front & rear panel connector diagrams

The following front panel and rear assembly drawings are not to scale and are intended to show relative positions of connectors, indicators and controls only.





Maintenance & storage

Maintenance:

No regular maintenance is required.

Care however should be taken to ensure that all connectors are kept clean and free from contamination of any kind. This is especially important in fibre optic equipment where cleanliness of optical connections is critical to performance.

Storage:

If the equipment is not to be used for an extended period, it is recommended the whole unit be placed in a sealed plastic bag to prevent dust contamination. In areas of high humidity a suitably sized bag of silica gel should be included to assist deter corrosion.

Where individual circuit cards are stored, they should be placed in antistatic bags. Proper antistatic procedures should be followed when inserting or removing cards from these bags.

Warranty & service

Equipment is covered by a limited warranty period of five years within Australia (3 years International) from date of first delivery unless contrary conditions apply under a particular contract of supply.

Equipment warranty is limited to faults attributable to defects in original design or manufacture. Warranty on components shall be extended by IRT only to the extent obtainable from the component supplier.

Equipment return:

Before arranging service ensure that the fault is in the unit to be serviced and not in associated equipment. If possible, confirm this by substitution.

Before returning equipment contact should be made with IRT or your local agent to determine whether the equipment can be serviced in the field or should be returned for repair.

The equipment should be properly packed for return observing antistatic procedures.

The following information should accompany the unit to be returned:

1. A fault report should be included indicating the nature of the fault
2. The operating conditions under which the fault initially occurred.
3. Any additional information which may be of assistance in fault location and remedy.
4. A contact name and telephone and fax numbers.
5. Details of payment method for items not covered by warranty.
6. Full return address.

Please note that all freight charges are the responsibility of the customer.

The equipment should be returned **to the agent who originally supplied the equipment or, where this is not possible**, to IRT direct as follows.

Equipment Service
IRT Electronics Pty Ltd
26 Hotham Parade
ARTARMON
N.S.W. 2064
AUSTRALIA

Phone: 61 2 9439 3744 Fax: 61 2 9439 7439
Email: service@irtelectronics.com

Drawing index

Drawing #	Sheet #	Description
803995	1	DAX-3200 block diagram
803995	2	DAX-3200 serial input schematic
803995	3	DAX-3200 Programmed Logic Array
803995	4	DAX-3200 Phase Locked Loop
803995	5	DAX-3200 AES output
803995	6	DAX-3200 analogue output
803995	7	DAX-3200 power supply
803995	8	DAX-3200 alarms and indicators
803995	9	DAX-3200 rear assembly connections
803995	10	DAX-3200 remote control