AAC-3390

Analogue Stereo to AES Audio Converter

IRT COMMUNICATIONS

User Manual

Revision History:

Revision	Date	By	Change Description	Applicable to:
01	01/02/2001	AL	IRT border page added for PDF format.	S/N ≥ 9911001
02	01/02/2001	AL	00COMMON.doc file contents added.	S/N ≥ 9911001
03	25/07/2002	SAH	Links updated.	S/N ≥ 9911001
04	30/03/2016	AL	Circuit description removed. Upgraded to I.R.T. Communications company name.	S/N ≥ 9911001

Table of Contents:

This instruction book applies to units with serial number ≥ 9911001.

OPERATIONAL SAFETY

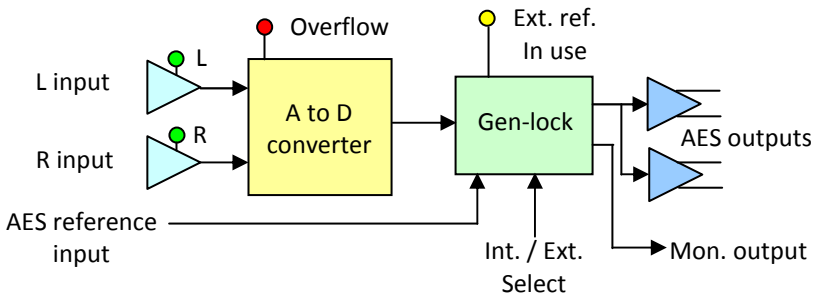
WARNING

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.

GENERAL DESCRIPTION

BLOCK DIAGRAM AAC-3390 SIGNAL PATH



The IRT AAC-3390 is an analogue audio to AES/EBU digital audio signal converter, and converts standard stereo analogue audio signals to the AES3-1992 and SMPTE-276 AES digital audio standard.

The input signals are a stereo pair of balanced audio at the standard +4 dBu line up level.

The outputs are three serial digital audio signals; one unbalanced BNC connection on the front panel for monitoring and two from the rear panel assembly. The latter can be 110 Ohms balanced using the ZAC-3391 rear panel assembly or 75 Ohms unbalanced BNC connections using the ZAC-3390 rear panel assembly.

A further input is provided for a reference AES input signal to lock the signal from the AAC-3390 to a station reference.

The reference input can be either 110 Ohms terminating balanced line or 75 Ohms terminating unbalanced line. Both connections are provided on the rear panel assembly. Selection of the input type is by links on the AAC-3390 main circuit board.

Front panel LED indicators are provided for DC voltage, presence of input audio levels above -30 dBu, lock to external AES reference and overflow at 0 dBFS corresponding to the +24 dBu full scale input audio level.

The AAC-3390 is designed to fit the IRT range of Eurocard mounting frames, including the 12 or 10 slot 3 RU and 2 slot 1 RU rack mounting frames.

Standard features:

- **Balanced stereo inputs.**
- **High impedance or 600 Ohm input termination.**
- **AES external reference input.**
- **Balanced 110 Ω or unbalanced 75 Ω AES output rear assembly options.**
- **Front panel AES monitoring point.**

TECHNICAL SPECIFICATIONS

Inputs:

Analogue inputs:

Number	2 channels – one stereo pair.
Type	> 30 kΩ balanced analogue audio.
Input coupling	AC
Input level setting	+24 dBu for 0 dBFS digital signal.
Input connector	Removable screw terminal block and Krone LSE IDC in parallel.

Reference input:

Type	1 x 110 Ω balanced terminating; and 1 x 75 Ω unbalanced terminating. Selected by links on module PCB.
Format	AES3-1992 standard.
Input level	200 mVp-p minimum.
Input cable length	> 500 m Belden (8281). > 200 m 110 Ω (AES digital high quality shielded pair).

Outputs:

AES/EBU:

Rear panel type ZAC-3390	2 x 75 Ω unbalanced >1 Vp-p.
or	
Rear panel type ZAC-3391	2 x 110 Ω balanced >3 Vp-p.
Front panel monitoring	1 x 75 Ω unbalanced >1 Vp-p.
Format	AES3-1992 standard.

Performance:

Sample rate	48 kHz internal rate, or as set by external reference.
Output signal rise and fall times	< 20 ns.
Frequency response	+/-0.05 dB 20 Hz to 20 kHz.
THD + N	-95 dB, 20 Hz – 20 kHz @ -4 dBFS.
Inter-channel crosstalk	-100 dB (20 Hz – 20 kHz).
Linearity	+/-0.5 dB at –90 dBFS.

Power Requirements:

Voltage	28 Vac CT (14-0-14) or ±16 Vdc
Power consumption	3.5 VA.

Connectors:

Unbalanced	BNC.
Balanced	Removable screw terminal blocks.

Other:

Temperature range		0 - 50° C ambient.
Mechanical		Suitable for mounting in IRT 19" rack chassis with input, output and power connections on the rear panel.
Finish:	**Front panel**	Grey background, black lettering & red IRT logo.
	Rear assembly	Detachable silk-screened PCB with direct mount connectors to Eurocard and external signals.
Dimensions		6 HP x 3 U x 220 mm IRT Eurocard.

CONFIGURATION

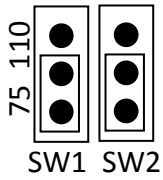
Link settings:

NOTE: Links LK6 and LK15 must both be set to the same setting, that is both OUT or both IN.

LK6 + LK15	**OUT**	Lock AES output to external AES reference (if present).
	IN	Lock AES output to internal 48 kHz clock reference.

NOTE: Links SW1 and SW2 must both be set to the same setting, that is both 75 or both 110.

SW1 + SW2	**75**	AES reference input 75 Ohm unbalanced BNC.
	110	AES reference input 110 Ohm balanced 3-pin Phoenix plug type.



Rear Assembly:

Rear assembly links LK1 and LK2 open circuit (default) = analogue input impedance > 30 kΩ.
Rear assembly links LK1 and LK2 short circuited = analogue input impedance 600 Ω.

To short circuit rear assembly links LK1 and LK2, solder a wire link in place.

Potentiometer settings:

RV1 and RV2 set the AES output level. This is factory set at 4dBFS with an analogue input level of +20dBu.

RV3 sets when the analogue audio LEDs illuminate and has been factory set for a -30 dBu analogue input signal.

INSTALLATION

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.

Signal Connections:

Input signal connections are made to the two removable screw terminal blocks at SK1 and SK2.

The audio inputs are bridging > 30 kΩ, if a 600 Ω termination is required close LK1 and LK2 with a wire link soldered at the LK1 and LK2 positions on the rear panel.

Output signal connections are made to connectors SK3 and SK4 on the selected rear panel of the AAC-3390.

Use rear panel ZAC-3390 for two unbalanced 75 ohms BNC output circuits or rear panel ZAC-3391 for two balanced 100 ohms output circuits.

The reference input signal can be either at SK5 a 75 ohms unbalanced terminating input or at SK6 a 110 ohms balanced terminating input, the **input selection** is done by links **SW1, SW2 on the module pcb** near pin 32 of the board connector. Move the links provided to the 75 or 110 positions marked on the board as required. The reference input signal will then be connected to the appropriate input connector on the rear panel.

The presence of AES signal at the output of the ZAC-3390 can be monitored using the front panel monitoring BNC socket provided.

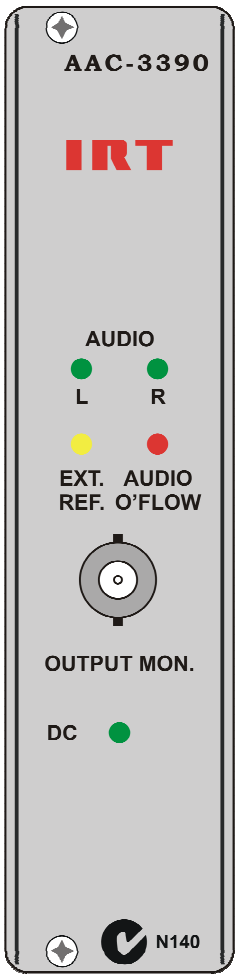
Selection of Internal or External Clock Reference:

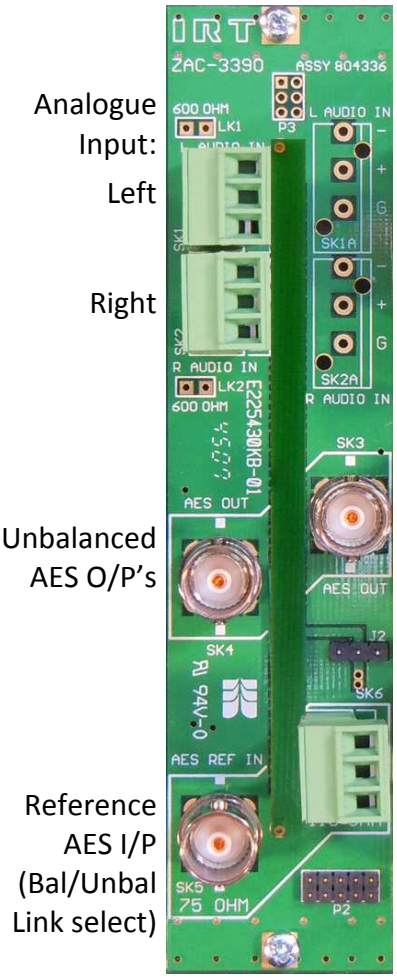
For **fixed internal** clock reference **close** links LK6 and LK15 on the module main circuit board.

For a clock reference selectable between the internal clock and the external clock **open** links LK6 and LK15 on the module main circuit board. In this mode of operation the AAC-3390 will lock to a external reference applied to the external reference input selected by SW1 and SW2, **whenever this reference is present** and **revert to the internal crystal clock reference if the external reference is removed.**

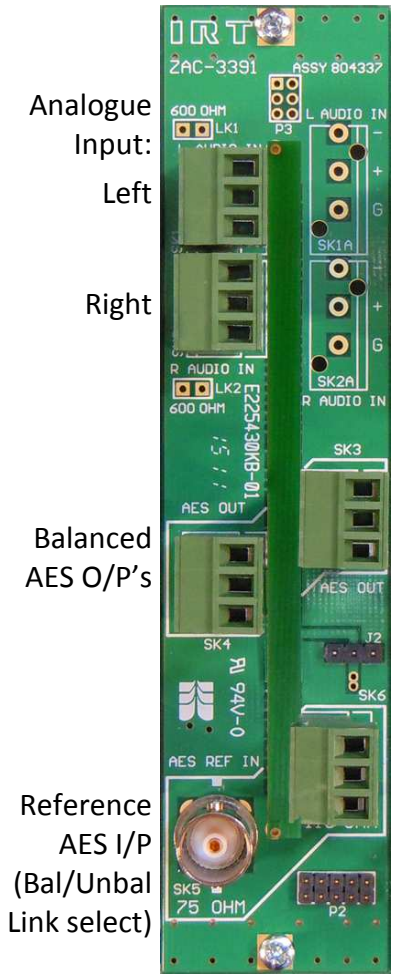
NOTE: It is important for the operation of the AAC-3390 that links LK6 and LK15 by **both open or closed together never individually**.

Front & rear panel connector diagrams:





ZAC-3390
Unbalanced AES O/P's
Rear Assembly
(Option)



ZAC-3391
Balanced AES O/P's
Rear Assembly
(Standard)

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 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 three years from date of first delivery unless contrary conditions apply under a particular contract of supply. For situations when "**No Fault Found**" for repairs, a minimum charge of 1 hour's labour, at IRT's current labour charge rate, will apply, whether the equipment is within the warranty period or not.

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.
7. For situations when "**No Fault Found**" for repairs, a minimum charge of 1 hour's labour will apply, whether the equipment is within the warranty period or not. Contact IRT for current hourly rate.

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 directly. Details of IRT's direct address can be found at I.R.T. Communications' website.

Web address: www.irtcommunications.com

Email: sales@irtcommunications.com