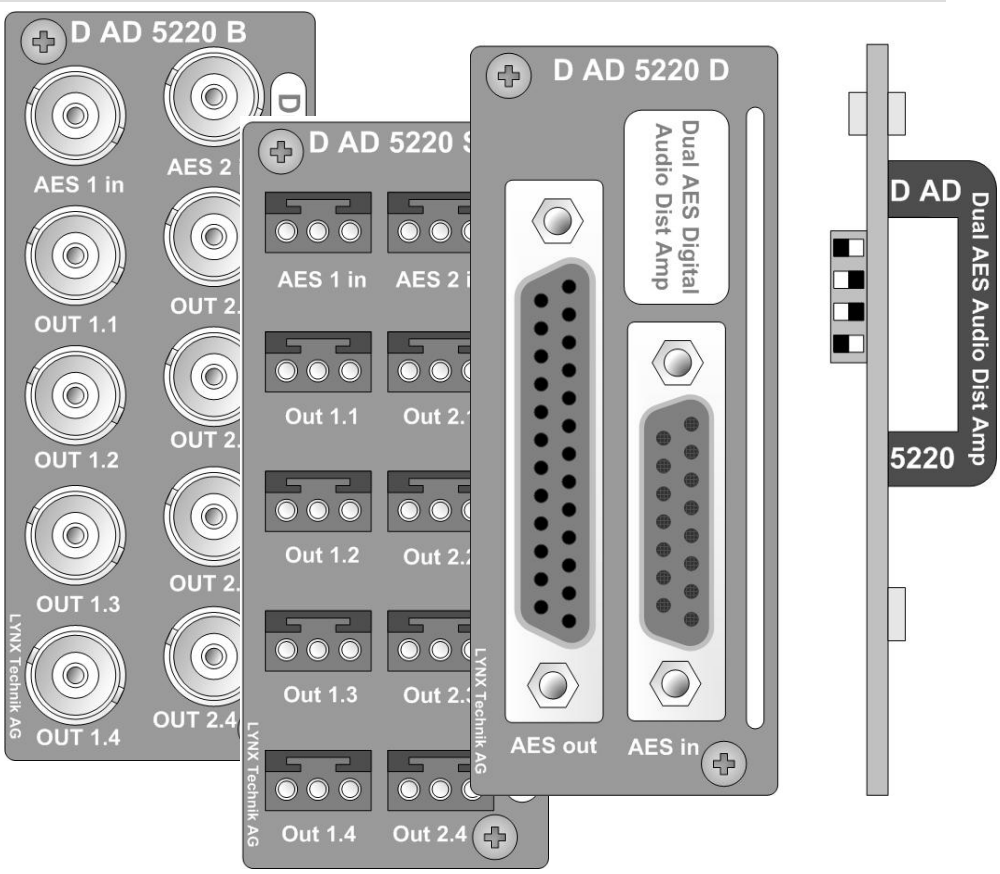
Version 2.0

Reference Manual

D AD 5220 B, D AD 5220 D, D AD 5220 S

Dual Digital Audio Distribution Amplifier

Series 5000 CardModule



Brunnenweg 3
D-64331 Weiterstadt
Germany
www.lynx-technik.com

Warranty

LYNX Technik AG warrants that the product will be free from defects in materials and workmanship for a period of two (2) year from the date of shipment. If this product proves defective during the warranty period, LYNX Technik AG at its option will either repair the defective product without charge for parts and labor, or will provide a replacement in exchange for the defective product.

In order to obtain service under this warranty, customer must notify LYNX Technik of the defect before expiration of the warranty period and make suitable arrangements for the performance of service. Customer shall be responsible for packaging and shipping the defective product to the service center designated by LYNX Technik, with shipping charges prepaid. LYNX Technik shall pay for the return of the product to the customer if the shipment is within the country which the LYNX Technik service center is located. Customer shall be responsible for payment of all shipping charges, duties, taxes and any other charges for products returned to any other locations.

This warranty shall not apply to any defect, failure, or damage caused by improper use or improper or inadequate maintenance and care. LYNX Technik shall not be obligated to furnish service under this warranty a) to repair damage resulting from attempts by personnel other than LYNX Technik representatives to install, repair or service the product; b) to repair damage resulting from improper use or connection to incompatible equipment; c) to repair any damage or malfunction caused by the use of non LYNX Technik supplies; or d) to service a product which has been modified or integrated with other products when the effect of such modification or integration increases the time or difficulty servicing the product.

THIS WARRANTY IS GIVEN BY LYNX TECHNIK WITH RESPECT TO THIS PRODUCT IN LIEU OF ANY OTHER WARRANTIES, EXPRESS OR IMPLIED. LYNX TECHNIK AND ITS VENDORS DISCLAIM ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. LYNX TECHNIK`S RESPONISIBILITY TO REPAIR AND REPLACE DEFECTIVE PRODUCTS IS THE SOLE AND EXCLUSIVE REMEDY PROVIDED TO THE CUSTOMER FOR BREACH OF THIS WARRANTY. LYNX TECHNIK AND ITS VENDORS WILL NOT BE LIABLE FOR ANY INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTAL DAMAGES IRRESPECTIVE OF WHETHER LYNX TECHNIK OR THE VENDOR HAS ADVANCE NOTICE OF THE POSSIBILITY OF SUCH DAMAGES.

Regulatory information

Europe

Declaration of Conformity

We LYNX Technik AG
Brunnenweg 3
D-64331 Weiterstadt
Germany

Declare under our sole responsibility that the products

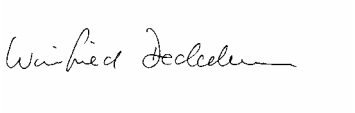
TYPE: D AD 5220 B, D AD 5220 D, D AD 5220 S

To which this declaration relates are in conformity with the following standards (environments E1-E3):

EN 55103-1 /1996
EN 55103-2 /1996
EN 60950 /2001

Following the provisions of 89/336/EEC and 73/23/EEC directives.

Winfried Deckelmann



Weiterstadt, January 2004

Place and date of issue *Legal Signature*

USA

FCC 47 Part 15

This device complies with part 15 of the 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.

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to the part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense

Contents

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Getting Started

Packaging

The shipping carton and packaging materials provide protection for the module during transit. Please retain the shipping cartons in case subsequent shipping of the product becomes necessary.

Product Description

The D AD 5220 is a high quality AES audio distribution amplifier designed primarily for broadcast and professional applications.

Flexible configurations allow the D AD 5220 to be used in dual 1 to 4 applications or 1 to 8 applications. Each AES input can have independent sample rates ranging from 32KHz to 108KHz. Signal presence detection is provided for each channel. Local presets / adjustments and alarms are provided on each module as well as optional remote control / status reporting and SNMP error reporting using the LYNX central control system.

The D AD 5220 is part of the 5000 series of CardModules, which offer high quality, modularity and flexibility in a small form factor ideal for applications where space is at a premium.

CardModules are installed in the series 5000 card frame that can accommodate up to 10 CardModules. All modules are hot swappable and Options include full redundant power and a range of controller options.

Functional Diagram

Figure 1 below is the basic functional diagram for the D AD 5220 CardModule.

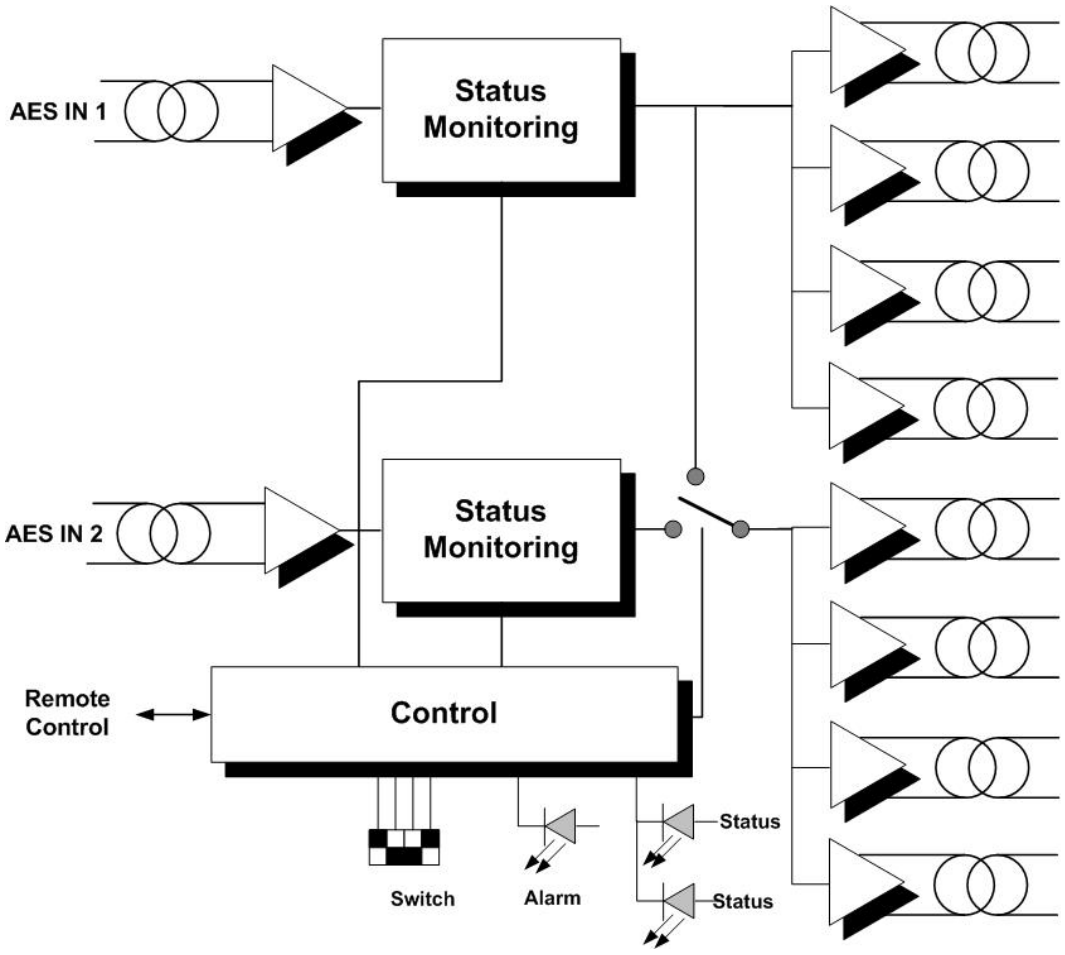

Figure 1.1- D AD 5220 D and D AD 5220 S Functional Diagram

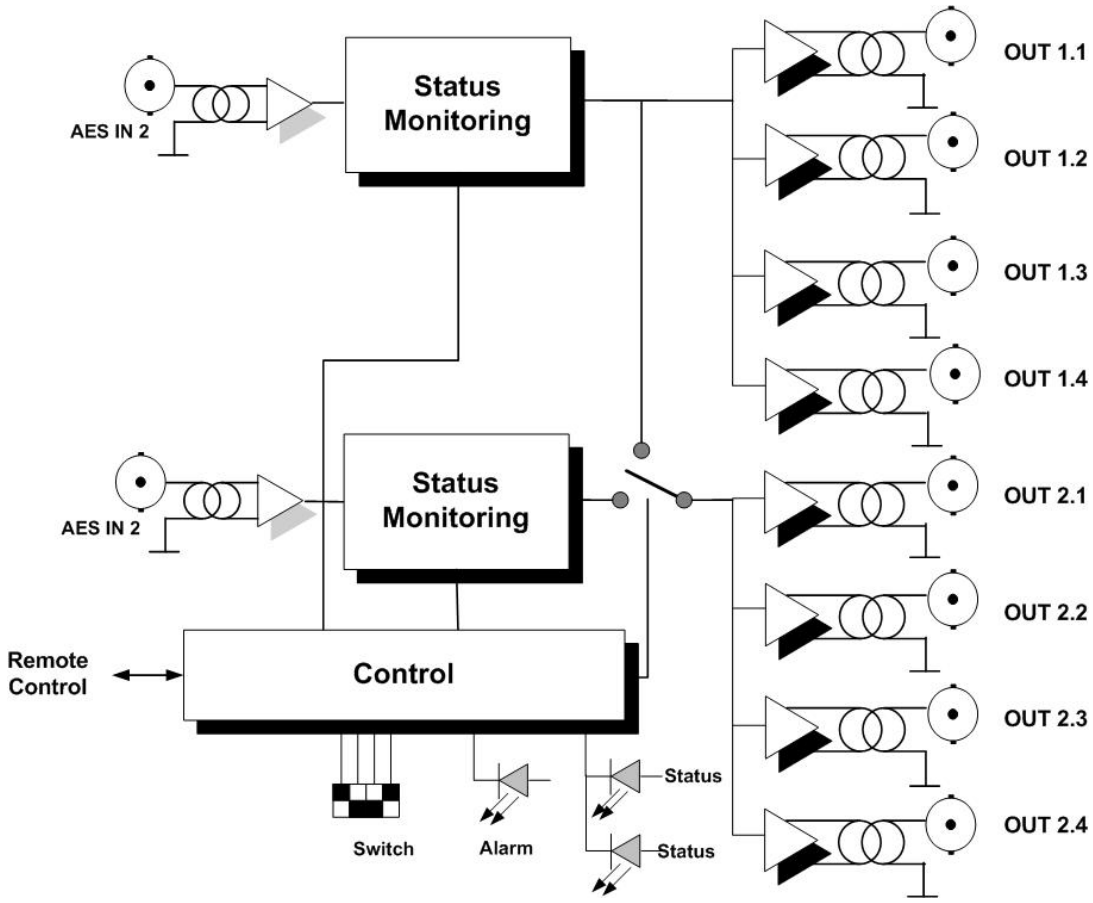

Figure 1.1- D AD 5220 B Functional Diagram

Module Layout

Figure 2 shows the layout of the D AD 5220 CardModule and the rear connection panel. The rear connection panel utilizes Sub D connectors for the audio input and outputs. Please refer the connections section of this manual for wiring details for the connectors.

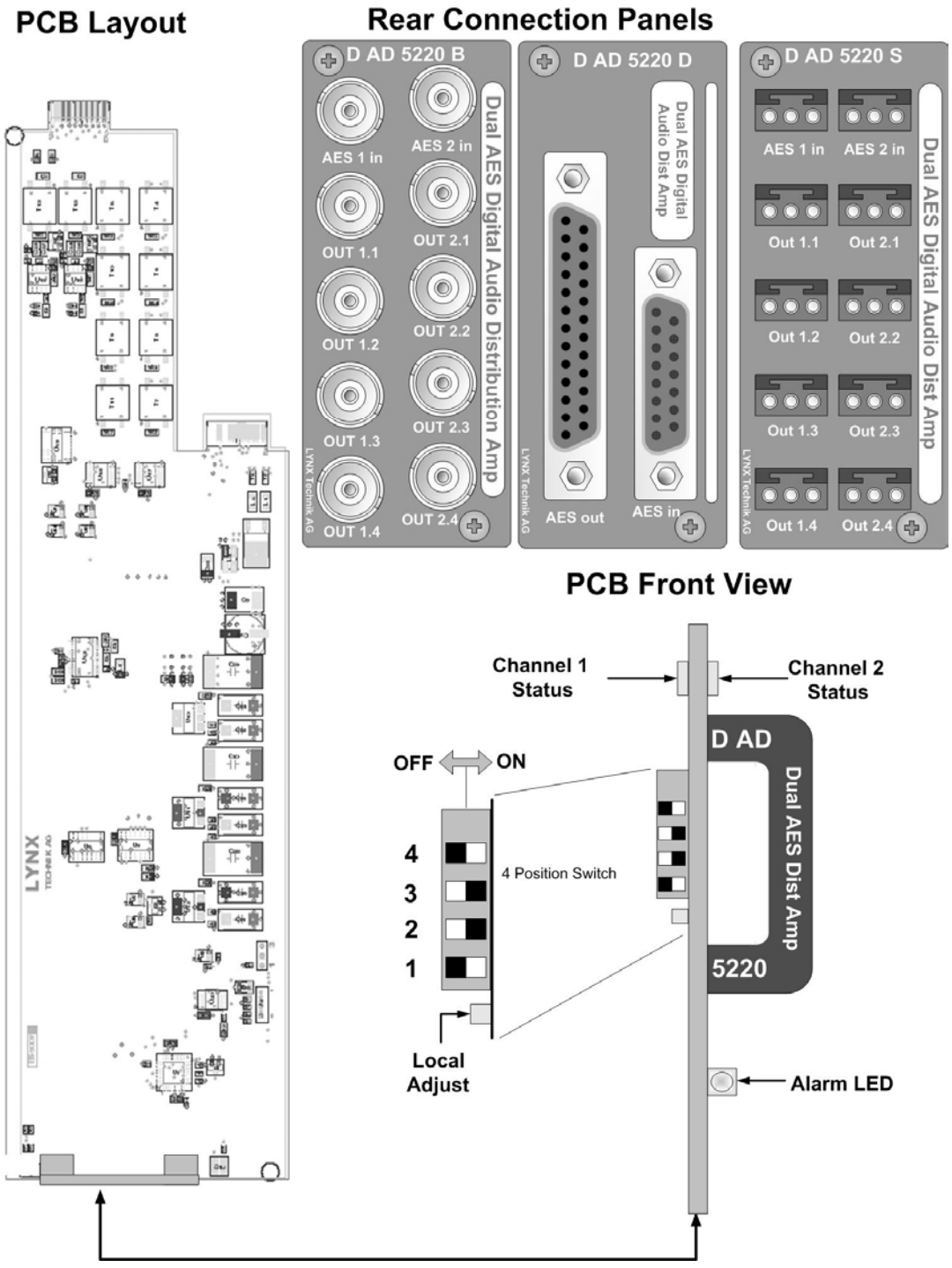

Figure 2 – Module Layout

Caution

Use static precautions when handling the PCB. Static discharge could result in serious damage to the module.

Connections

D AD 5220 B Audio Connections

The D AD 5220 B MiniModule is configured for BNC audio connections. Connection is self-explanatory. Please use high quality screened cable to prevent the introduction of noise and interference to the audio signals.

D AD 5220 D Audio Connections

The D AD 5220 D MiniModule is configured for SubD audio connections. These connectors should be wired in accordance with the tables below. Please use high quality screened cable to prevent the introduction of noise and interference to the audio signals (twisted pair suitable for balanced audio signals).

Audio Output Connections (balanced)

SubD 25 pin female connector. (TASCAM pinout)

Pin Number	Connection	Pin Number	Connection
1	+ OUT 1.1	14	- OUT 1.1
2	GND OUT 1.1	15	+ OUT 2.1
3	- OUT 2.1	16	GND OUT 2.1
4	+ OUT 1.2	17	- OUT 1.2
5	GND OUT 1.2	18	+ OUT 2.2
6	- OUT 2.2	19	GND OUT 2.2
7	+ OUT 1.3	20	- OUT 1.3
8	GND OUT 1.3	21	+ OUT 2.3
9	- OUT 2.3	22	GND OUT 2.3
10	+ OUT 1.4	23	- OUT 1.4
11	GND OUT 1.4	24	+ OUT 2.4
12	- OUT 2.4	25	GND OUT 2.4
13	NC		

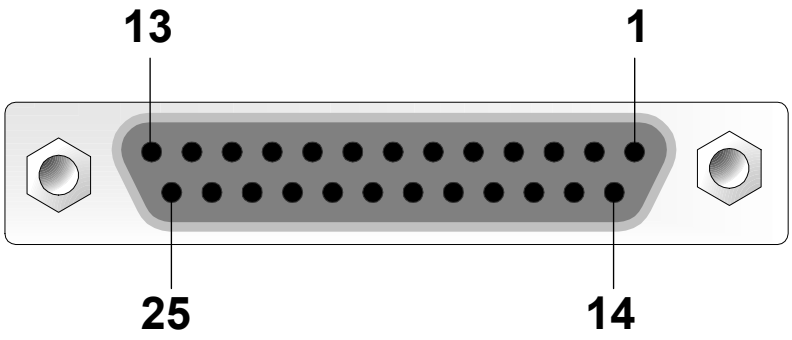

Figure 3 – D AD 5220 D Audio output connection detail

Audio Input Connector (balanced)

SubD 15-pin female connector

Pin Number	Connection	Pin Number	Connection
1		9	
2		10	
3		11	
4	+ AES 1	12	- AES 1
5	GND AES 1	13	+AES 2
6	- AES 2	14	GND AES 2
7		15	
8			

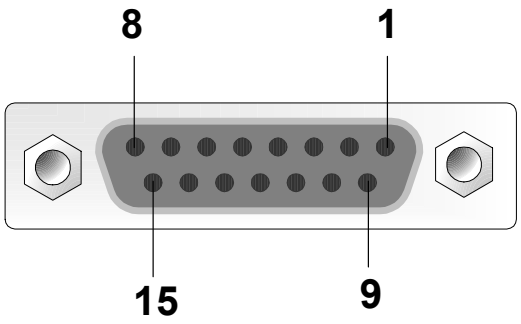

Figure 4 – Audio input connection detail

Audio Connections (un-balanced)

Although the module is designed primarily for balanced line audio connections it is possible to make un-balanced audio connections to the module.

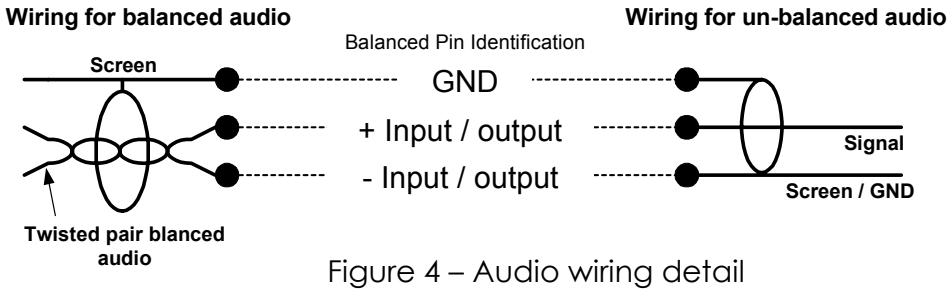

Figure 4 – Audio wiring detail

NOTE. When used in this manor certain technical specifications of the module cannot be maintained.

D AD 5220 S Audio Connections

The D AD 5220 S CardModule rear connection panel is configured for Weco type audio connections. These connectors should be wired in accordance with the table below. Please use high quality screened cable to prevent the introduction of noise and interference to the audio signals (twisted pair suitable for balanced audio signals).

Audio Connections (balanced)

Weco 3 pin connector

Pin Number	Connection
1	Positive (+)
2	GND
3	Negative (-)

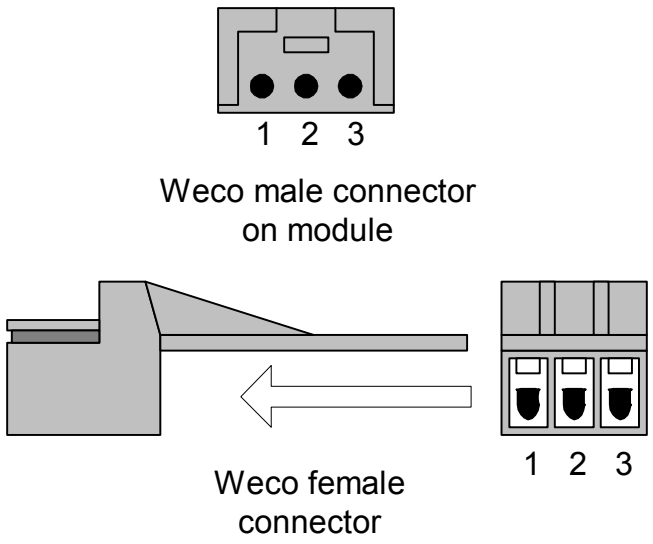

Figure 5 - Weco connection detail

Installation

Caution
The CardModule is shipped in a protective anti-static bag. Please take suitable precautions to avoid static discharge onto any part of the PCB or components when handling module or serious damage could result.

Each Card Module is supplied with a rear connection panel and two mounting screws. Please follow the following procedure for installation of the card module into the Series 5000 Card Frame.

a) Select a slot in the card frame where the CardModule will be located
b) Remove the blank connection panel from the rear of the rack (if fitted)
c) Install the rear connection panel using the screws supplied. Do not tighten the screws fully
d) Slide the card module into the card frame and carefully check the CardModule easily connects to the rear connection plate. The card should fit easily and should not require excessive force to insert, if you feel any resistance, there could be something wrong with the rear connection panel location. Do not try and force the connection. Remove the rear connection panel and check alignment with the CardModule.
e) Insert and remove the CardModule a few times to ensure correct alignment and then tighten the two screws to secure the rear connection plate

Settings and Control

The D AD 5220 has an integrated micro-controller, which enables the module to be configured and controlled locally via the dip-switch, or from remote when using one of the optional controllers and control software.

Once set, all settings are automatically saved in non-volatile internal memory. (Flash ram) The module will always recall the settings used prior to power down.

The module local configuration are performed using a 4-position dip-switch on the front edge of the module (please refer to figure 2).

Switch Settings

Below the switch settings for the 4-position dip-switch are defined. Please refer to figure 2 for the location of the switch.

Switch	Setting	Function
1	ON	Enable Local Adjustment
	OFF	Disable Local Adjustment
2	ON	Dual 1 > 4 mode
	OFF	Single 1 > 8 mode
3	ON	Not Used
	OFF	Not Used
4	ON	Not Used
	OFF	Not Used

Factory Preset Condition

The D AD 5220 is delivered with stored presets for the following functionality:

Local Adustment enabled
Dual 1 > 4 mode

No further adjustments are needed if this is the functionality desired.

Switch Function Detail

All settings are stored in Flash Ram inside the module (see Auto Store section in this manual). Settings will be recalled on power up.

Dip Switch 1

This switch enables local control using the dip-switches. **ON** enables local control and makes selections on the dipswitch active, and **OFF** disables local control (locking out any local changes)

Note.

*When Switch 1 is initially switched to **ON**, the static settings currently set on the dip-switches may not reflect the actual configuration stored in the module. This is because all settings can be changed from the remote control system or via the Service Adapter. This overrides the local dip switches regardless of Switch 1 ON/OFF setting. To ensure the module reads the local dip switch settings it is recommended to toggle Switch 1 **ON-OFF-ON** before making any local changes to the dip switches.*

Dip Switch 2

This switch selects the mode of operation for the module. **ON** selects dual 1 into 4 mode where each individual AES input is distributed to four outputs. **OFF** selects 1 into 8 mode where input ***AES in 1*** is distributed to all 8 outputs.

Dip Switch 3

This is not used

Dip Switch 4

This is not used

Auto Store

If no parameters are changed for 10 seconds then the current settings will be written into flash memory automatically, this can be seen by the channel condition LEDS flashing yellow four times.

Alarm/LED Status Indicators

The D AD 5220 module has LED indicators that serve as alarm and status indication for the module. Function is described below.

The Indicators are found on the front edge of the module PCB. Status indicators are at the top and the alarm LED is at the bottom. (Figure 2)

Channel Condition Indicators

Channel Status LED`s are provided on the module front edge, which has three color states. LED 1 is for ***AES in 1*** and LED 2 is for ***AES in 2***.
Note. When in 1:8 mode LED2 is always **OFF**

LED Color	Indication
Green	Input Signal Present / locked
Yellow	AES errors (Parity errors)
Red	Input signal not present / not locked

Front Panel Alarm Indicator

There is also a single alarm LED on the module, (figure2) which is designed for quick and easy indication of a problem condition and is visible through the front cover of the card frame.

LED Color	Indication
Green	Input signals present
Yellow	One input missing / errors (only in dual mode)
Red	Input signals lost

Normal status is **GREEN**

Locate Function

For larger systems which may have multiple cards of the same type in a single rack, or multiple rack systems on a large central control system we have added a useful utility which will help to visually locate a suspect module quickly (When used in conjunction with the optional control system and software)

Once the specific module has been selected on the control system there is a locate button on the top of the GUI:

Locate Function in Control System

When Locate is selected the status indicator on the GUI and the module LED's will flash yellow in the following continuous sequence.

3 short flashes…. Pause…. 3 short flashes …

This uses the alarm LED located on the front of the module and in some cases any channel or status LED's that may be used in the module.

Use of the locate function will not interfere with the normal operation of the module.

For more details on this feature please check the documentation supplied with the controller software.

Specifications *(D AD 5220)*

Inputs	
Signal	D AD 5220 D and D AD 5220 S: 1 or 2 (switchable) AES 3 balanced transformer isolated inputs D AD 5220 B: 1 or 2 (switchable) AES 3- id unbalanced transformer isolated inputs
Input Impedance	D AD 5220 D and D AD 5220 S: 110 Ohms D AD 5220 B: 75 Ohm
Connection	D AD 5220 B: BNC D AD 5220 D: Sub D 15 pin female D AD 5220 S: WECO single
Return Loss	<25dB (32KHz to 100KHz)
Outputs (digital)	
Signal	D AD 5220 D and D AD 5220 S: 8 x AES 3 balanced transformer isolated outputs D AD 5220 B: AES 3- id unbalanced transformer isolated outputs
Output Impedance	D AD 5220 D and D AD 5220 S: 110 Ohms D AD 5220 B: 75 Ohm
Connection	D AD 5220 B: BNC D AD 5220 D: Sub D 15 pin female D AD 5220 S: WECO single
Output Level	D AD 5220 D and D AD 5220 S: 4.0V p-p (nom.) D AD 5220 B: 1.0V p-p (nom.)
Operating Modes	
Dual	2 audio input channels with 4 outputs each
Single	1 audio input channel with 8 outputs
Performance	
Sample Rate	32kHz to 108kHz (independent for each input channel)
Jitter	< 0.025 UI
Status Monitoring	Input present, confidence flag, AES bi-phase coding and parity error
Control	Remote Control of configuration (dual/single), remote monitoring of signal status
Electrical Specifications	
Operating Voltage	+ 12 V DC
Power Consumption	3.0 VA
Safety	IEC 60950/ EN 60950/VDE 0805
Mechanical	
Size	283mm x 78mm
Weight	Card module 120g, connection panel 50g
Ambient	
Temperature	5°C to 40°C Maintaining specifications
Humidity	Max 90% non condensing
Supplied Accessories	
Documentation	D AD 5220 D Reference Manual

Available Options

Below is a list of related products for the D AD 5220 CardModule. Please refer to product brochures or our web site for more detailed information.

Model	Description
R FR 5010	**Series 5000 Rack Frame (empty) with single power supply**
R PS 5010	**Redundant power supply for the R FR 5010 Card Frame**
R CT 5030	**master controller with TCP/IP Interface for the R FR 5010 Card Frame**
R CT 5020	**Rack controller for the R FR 5010 Card Frame**
R CT 5010	**Rack Bus Extension for the R FR 5010 Card Frame. In combination with R CT 5020**

Parts List

Due to the very dense design and miniature surface mount technology the module is not field serviceable. The information for a replacement assembly is below.

D AD 5220 B CardModule (complete)

Description	Digital Audio D Amp
Model Number	D AD 5220 B
Part Number	6.155.008.241

Sub Assemblies:

D AD 5220 Processing Board only (BS 5007)
Part Number 6.155.003.253

Rear Connection Panel for D AD 5220 B (MA 5009)
Part Number 6.155.009.231

D AD 5220 D CardModule (complete)

Description	Digital Audio D Amp
Model Number	D AD 5220 D
Part Number	6.155.008.240

Sub Assemblies:

D AD 5220 Processing Board only (BS 5007)
Part Number 6.155.003.253

Rear Connection Panel for D AD 5220D (MA 5010_C)
Part Number 6.155.008.345

D AD 5220 S CardModule (complete)

Description	Digital Audio D Amp
Model Number	D AD 5220 S
Part Number	6.155.008.242

Sub Assemblies:

D AD 5220 Processing Board only (BS 5007)
Part Number 6.155.003.253

Rear Connection Panel for D AD 5220 S (MA 5003)
Part Number 6.155.008.246

Service

If you are experiencing problems, or have questions concerning your D AD 5220 D CardModule please contact your local distributor for assistance.

We offer a fixed cost service exchange program for defective Series 5000 CardModules out of Warranty. Please contact your distributor or check our web site for details on this program.

More detailed information and product updates may be available on our web site:

www.lynx-technik.com

You will also find links to contact us directly for assistance.

Contact Information

Please contact your local distributor; this is your local and fastest method for obtaining support and sales information.

LYNX Technik can be contacted directly using the information below.

Address	LYNX Technik AG Brunnenweg 3 D-64331 Weiterstadt Germany.
Website	www.lynx-technik.com
E-Mail	info@lynx-technik.com

LYNX Technik manufactures a complete range of high quality modular products for broadcast and Professional markets, please contact your local representative or visit our web site for more product information.

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Notes