LYNXTechnik AG

Broadcast Television Equipment

Reference Manual

P DX 5362

SD/HD Digital and Analog Audio Deembedder

Revision 1.2
January 2009

LYNX Technik AG
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Germany
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Contents

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, INCIDENTIAL, OR CONSEQUENTIAL 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 product

TYPE: **P DX 5362**

To which this declaration relates is 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, April 2007

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

Getting Started

Most CardModules are installed into the rack frames and system tested in the factory. If this is an upgrade part or service exchange item then the module is supplied in a padded cardboard carton which includes the CardModule, rear connection plate and mounting screws.

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. Do not remove the module from its protective static bag unless observing adequate ESD precautions. Please see below.

ESD Warning

This product is static sensitive. Please use caution and use preventative measures to prevent static discharge or damage could result to module.

Preventing ESD Damage

Electrostatic discharge (ESD) damage occurs when electronic assemblies or the components are improperly handled and can result in complete or intermittent failure.

Do not handle the module unless using an ESD-preventative wrist strap and ensure that it makes good skin contact. Connect the strap to any solid grounding source such as any exposed metal on the rack chassis or any other unpainted metal surface.

Caution

Periodically check the resistance value of the antistatic strap. The measurement should be between 1 and 10 Megohms.

Product Description

The P DX 5362 is a high quality multi-format deembedder providing two digital AES and two analog stereo audio outputs.

Two Multirate SDI outputs are also provided, which can be used as a distribution amplifier.

Input Formats

The module has one multi-format serial digital input with automatic input detection. The module will detect the following input standards and configure the input stage automatically for operation in the connected format.

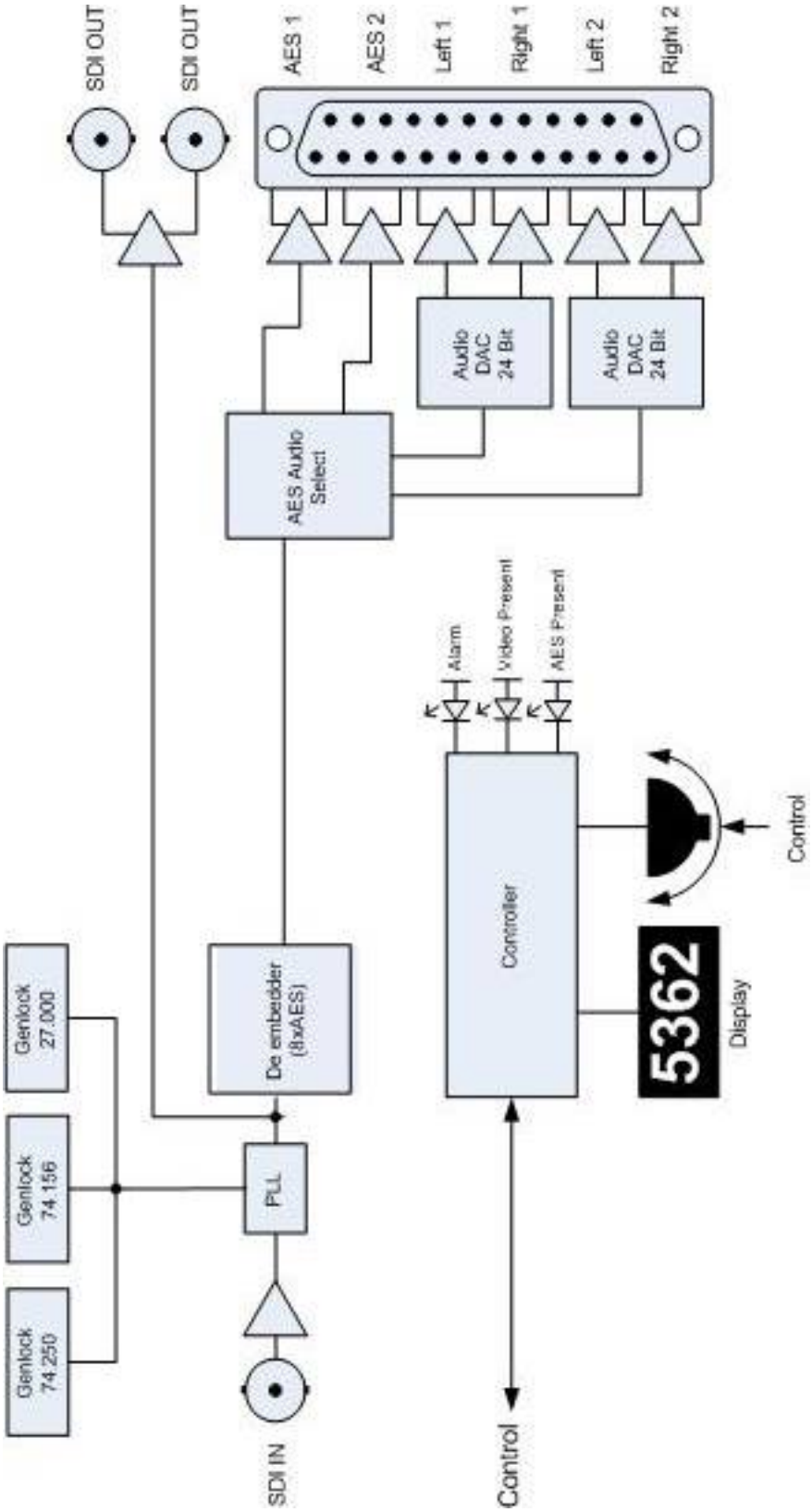
SDTV Formats	HDTV Formats
525 / 59.94Hz	1080i / 59.94Hz
625 / 50Hz	1080i / 60Hz
	1080i / 50Hz
	720P / 59.94Hz
	720P / 60Hz
	720P / 50Hz

Audio Processing

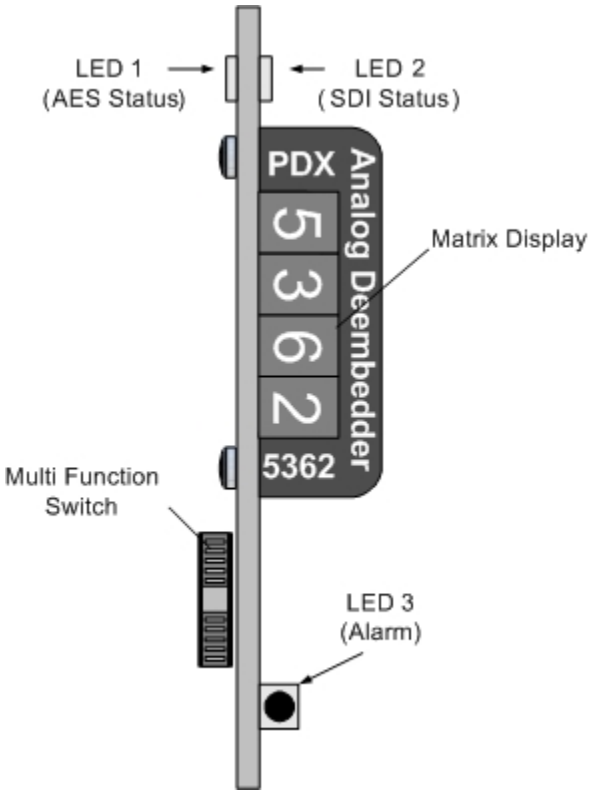
The module de-embeds the complete audio payload (8xAES) from the incoming SDI signal.

Any two of the de-embedded AES signals can be selected and output as external digital AES signals (balanced AES3 signals on the SubD connector). Two additional AES signals can be selected and output as balanced analog outputs via high quality 24 bit Audio D/A converters. Full scale ranging, adjustable gain and de-emphasis is provided for each analog audio output. Balanced analog audio outputs are provided on the integrated 25 pin SubD connector.

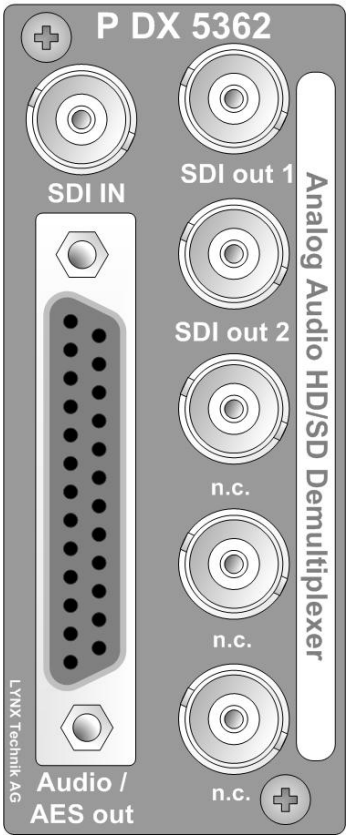
Functional Diagram



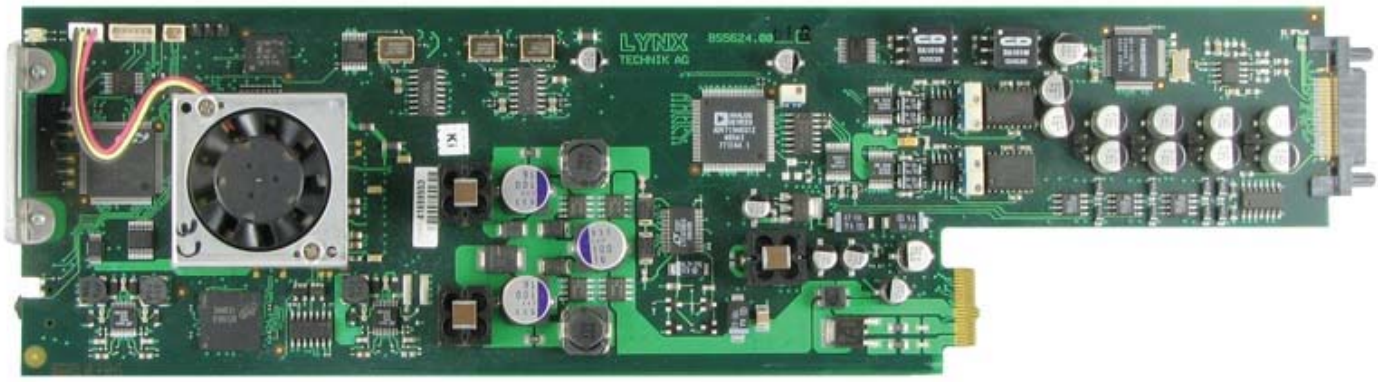
Module Layout



Module Front Panel



Module Rear Termination Panel



CardModule Layout

Connections

Video

The P DX 5362 uses standard 75 Ohm BNC connectors. We recommend the use of high quality video cable for digital video connections to reduce the risk of errors due to excessive cable attenuation. Max cable lengths the module will support are shown below.

SDTV = 250m Belden 8281 (270Mbits/s)
HDTV = 140m Belden 1694A (1.4Gbits/s)

> ***Note.*** *Due to the compact design of the connection plate it will be necessary to use a connection tool to secure the BNC video connectors.*

Audio

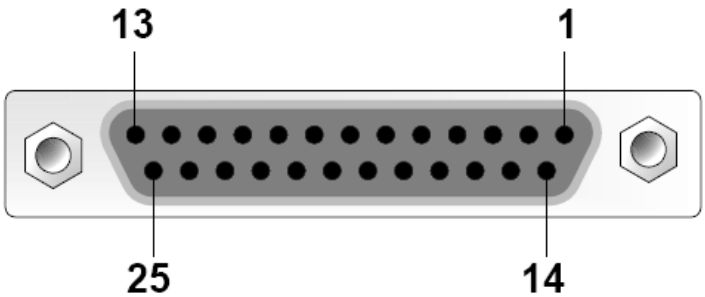
Digital Audio (AES)

The module provides for both Unbalanced (AES3id) and Balanced (AES3) connections. Unbalanced connections are made using the two BNC connectors (AES 1 and AES2) Balanced connections are made via the 25 pin SubD connector. Connection details shown below.

Analog Audio

Balanced analog audio connections are made using the 25 pin SubD connector. Connection details shown below.

Pin Number	Connection	Pin Number	Connection
1	Analog 1 L +	14	Analog 1 L -
2	Analog 1 L GND	15	Analog 1 R +
3	Analog 1 R -	16	Analog 1 R GND
4	Analog 2 L +	17	Analog 2 L -
5	Analog 2 L GND	18	Analog 2 R +
6	Analog 2 R -	19	Analog 2 R GND
7	AES 1 +	20	AES 1 -
8	AES 1 GND	21	AES 2 +
9	AES 2 -	22	AES 2 GND
10	(n.c)	23	(n.c)
11	(n.c)	24	(n.c)
12	(n.c)	25	(n.c)
13	(n.c)		



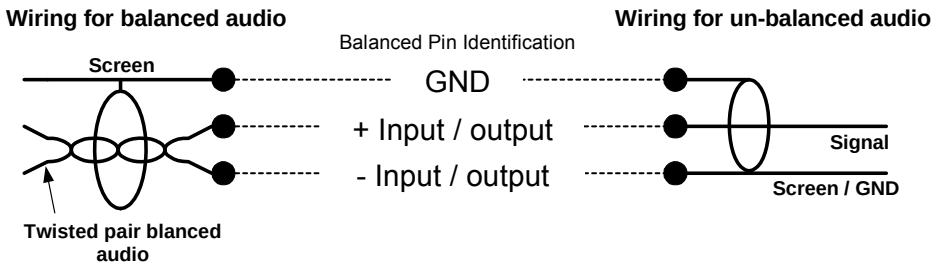
View looking INTO connector as seen on module

We recommend you use high quality screened (twisted pair) cable for the balanced audio connections. LYNX has an optional audio breakout cable which will bring out all audio connections to in line XLR connectors. Model number **R AC M25-8**

Audio Output 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.

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



Installation

If this module was supplied as part of a system it is already installed in the rack enclosure. If the module was supplied as a field upgrade please follow the installation procedure below.

***NOTE** Observe static precautions when handling card. Please see ESD warnings on Page 5.*

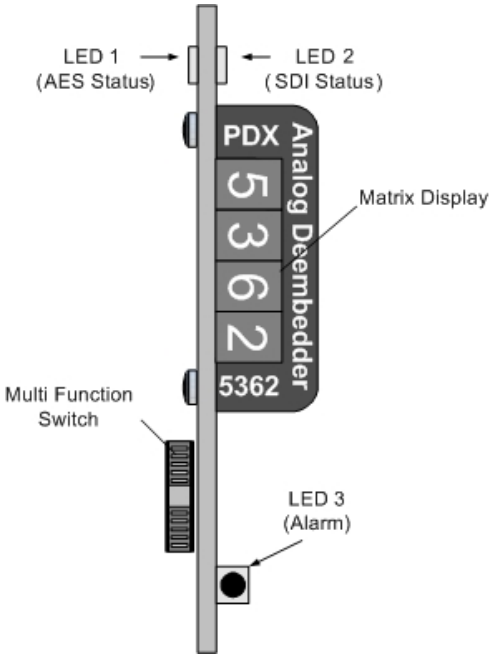
Each Card Module is supplied with a rear connection panel and two mounting screws. Please follow the following procedure for installation of the card module into the Series 5000 Card Frame.

1. Select a slot in the card frame where the CardModule will be located.
2. Remove the blank connection panel from the rear of the rack (if fitted)
3. Install the rear connection panel using the screws supplied. Do not tighten the screws fully
4. Slide the card module into the card frame and carefully check the CardModule 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 this may damage the connectors. Remove the rear connection panel and check alignment with the CardModule.
5. Insert and remove the CardModule a few times to ensure correct alignment and then tighten the two screws to secure the rear connection plate.

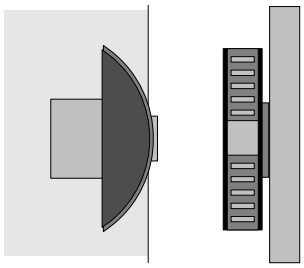
Settings and Control

The P DX 5362 module has an integrated micro-controller, which enables the module to be configured and controlled locally using the multifunction switch and 4 character dot matrix display (or from remote using a GUI interface when using one of the optional controllers and control software).

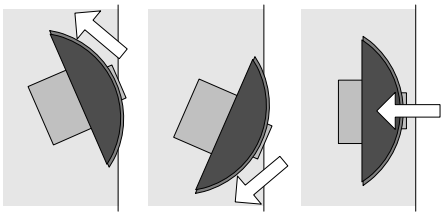
Once set, all settings are automatically saved in non-volatile internal memory. (Flash RAM) The module will always recall the last used settings.



Multi-function Switch



Switch Operations



Multi Function Switch

The CardModule is equipped with a multi-function switch located on the front bottom edge of the card. (See above)

Using the Local Display Menus

Making local adjustments to the module is done using the multifunction switch and the integrated 4-character dot matrix display. The menu system is layered, and navigation through the system is done using the **UP** and **DOWN** functions of the switch. **ENTER** is used to move between menu levels and also enter a selection.

Switch Function	Operation
UP	Move UP within a level
DOWN	Move down within a level
ENTER	Change levels / Make selection

Menu Structure

The Menu structure is defined in the next table, and should be used when navigating through the system.

ENTER moves between levels
UP/DOWN moves between items within the level
When you enter a new setting the system will jump back one level in the menu system.

- The “back” selection in the menu structure will take you back one level when selected.
- When an item is selected which has several setting possibilities the first value displayed will be the value currently stored in the system. The order of the available settings for any menu item in the table supplied does not represent the order the settings will actually be displayed.
- If left unattended, the menu will default to the root display after a preset timeout.

LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5	LEVEL 6	DESCRIPTION
PDX 5362						Root Display
	OUT					
		AAUD				Analog Audio
			FSLV			Full Scale Level
				12dB		12dB Full Scale
				15dB		15dB Full Scale
				18dB		18dB Full Scale
				20dB		20dB Full Scale
				22dB		22dB Full Scale
				24dB		24dB Full Scale
				back		
			CH12CH34			Audio Channel Select
				GAIN		Gain Adjustment
					CH1 CH2 CH12 CH3 CH4 CH34	(CH12 = Channels 1 and 2 Ganged together) (CH 34 = Channels 3 and 4 Ganged together)
						-3.0 ... 3.0
				MUTE		Mute Audio
					OFF	
					ON	
					back	
				DEMP		Audio De-emphasis
					OFF	
					ON	
					back	

				back		
			back			
		back				
	RSET					Factory Reset
		NO				No
		YES				Yes
	back					

LED Status Indicators

The P DX 5624 module has LED indicators that serve as alarm and status indication for the module. Function is described below.

AES Status LED 1

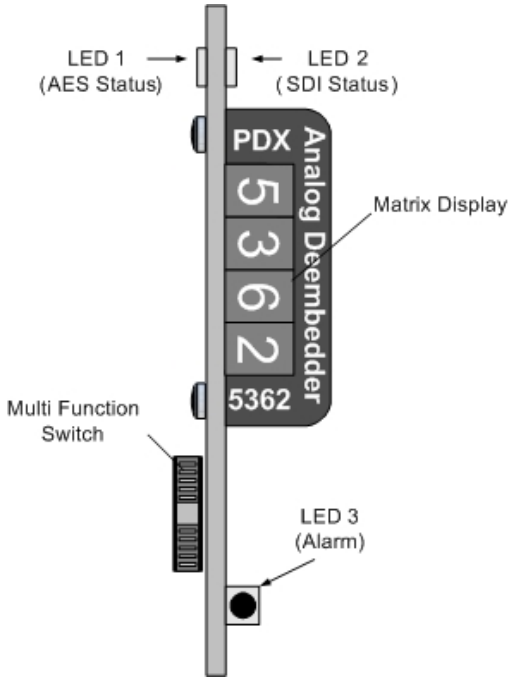
LED Color	Indication
Green	AES 1 and AES 2 Present
Yellow	Only one AES Present
Red	No Audio Present

SDI Status LED 2

LED Color	Indication
Green	Input 1 SDI Present
Red	Input Missing

Alarm LED 3

LED Color	Indication
Green	Video Present PLL Locked
Yellow	Test Pattern Selected
Red	No Video Present / PLL Unlocked



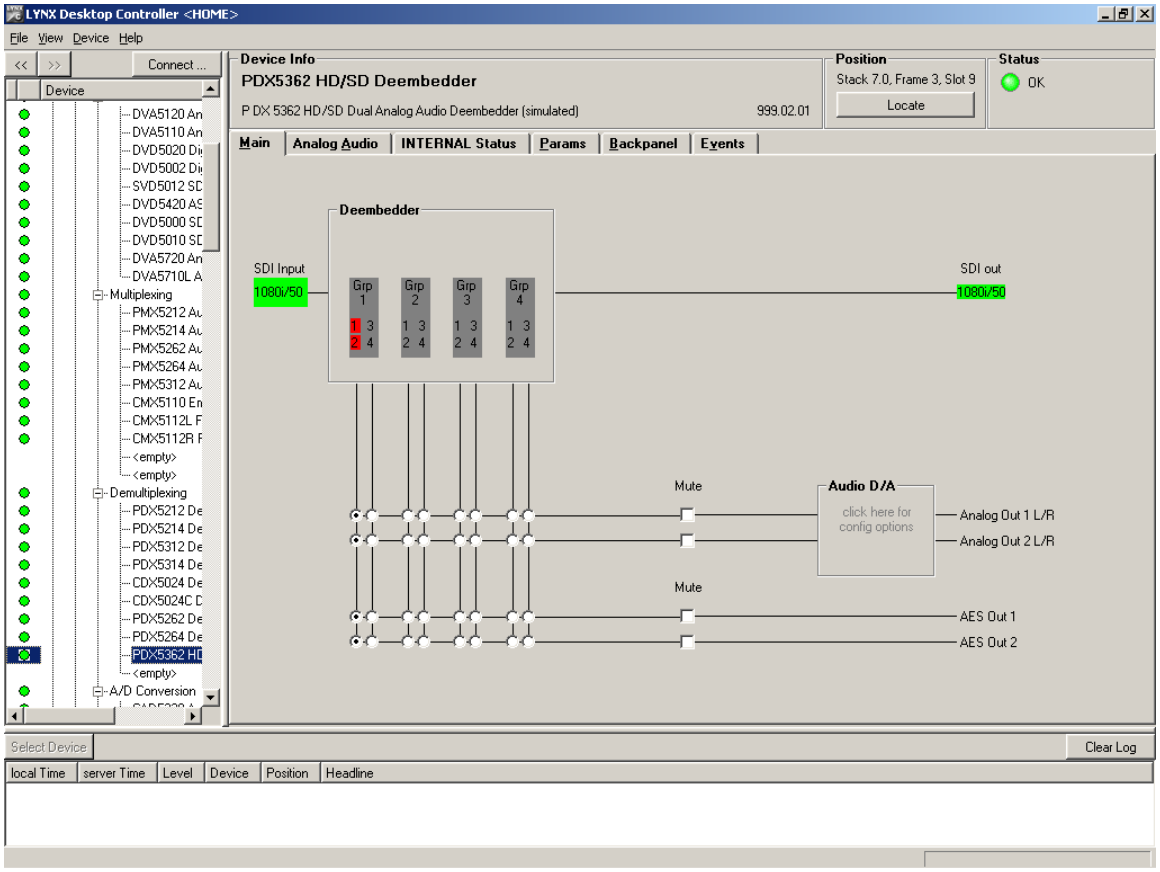
Control System GUI

All LYNX CardModules support a computer interface which allows setting the modules parameters using a simple GUI interface. Access to all standard features (and in some cases) extended features is possible using this interface.

Access to the GUI requires the use of the optional LYNX control system

> ***Note.*** *Any settings made using the control system overrides any local settings made on the module. All settings are stored in internal flash ram and will survive power cycles and long term storage.*

The GUI screenshots below show the settings and adjustments possible for the P DX 5362 CardModule.



The above screenshot shows the complete module GUI. The Device info area contains information about the module including name and firmware revision. If used as part of a larger system (using the LYNX central control system) the modules position and physical location is displayed above the “locate” button.

> ***Note.*** *The Locate function us a tool used to quickly identify a module in larger systems. Selecting “locate” will flash the module alarm LED yellow. (does not effect module operation)*

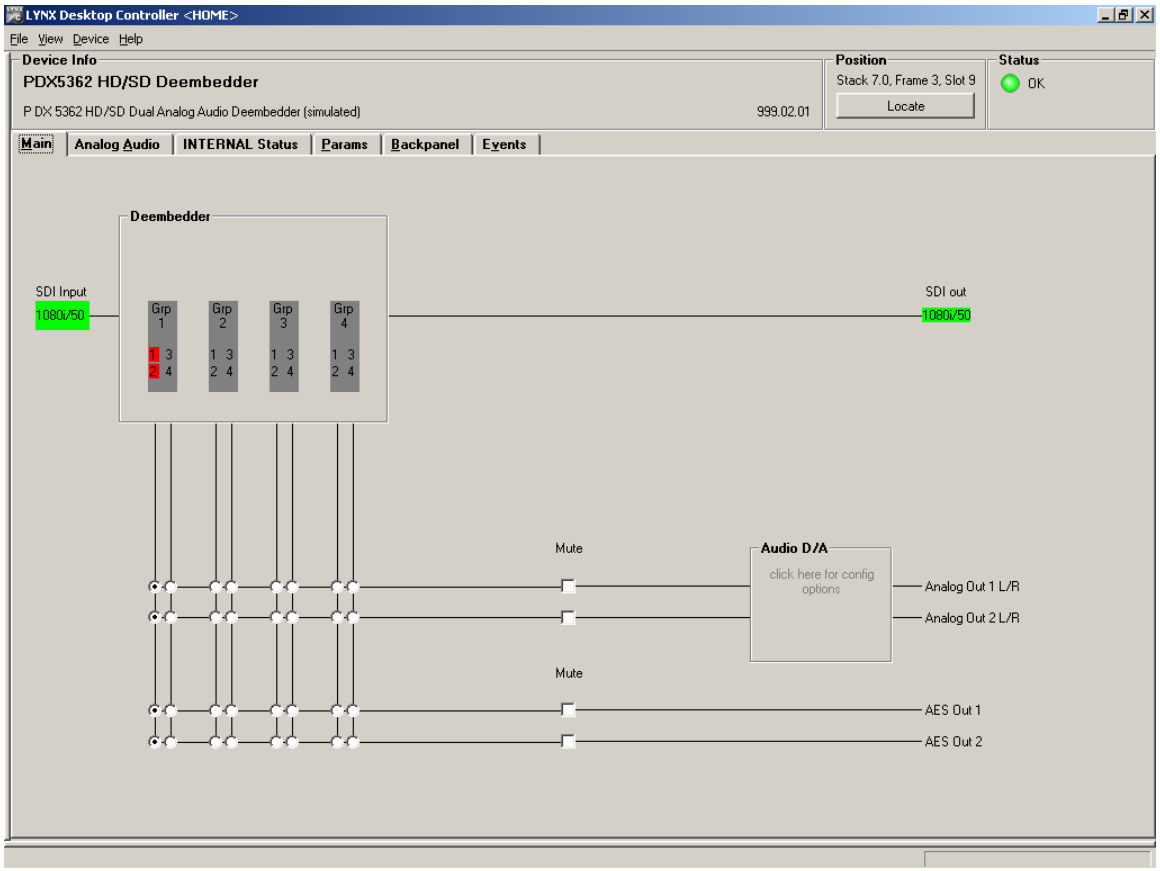
The first screen you see when the module is selected is the ***Main*** tab this is a graphical representation of the modules function and signal flow (left to right). Clicking on processing boxes where shown will link to other GUI screens with controls for these specific functions.

The area at the bottom of the screen is the error log. Any fault condition will be timestamps and entered into the log (as long as the controller / adapter is connected)

There are a number of Tabs associated with each Module which splits up the modules settings into a number of separate screens. The various GUI screens and functions are described below.

Main Tab

This screen is the main GUI interface and is presented first when the module is displayed in the GUI. The layout replicates function and the signal flow if from left to right. Selections are made using onscreen sliders, radio buttons, drop down selections and checkboxes.

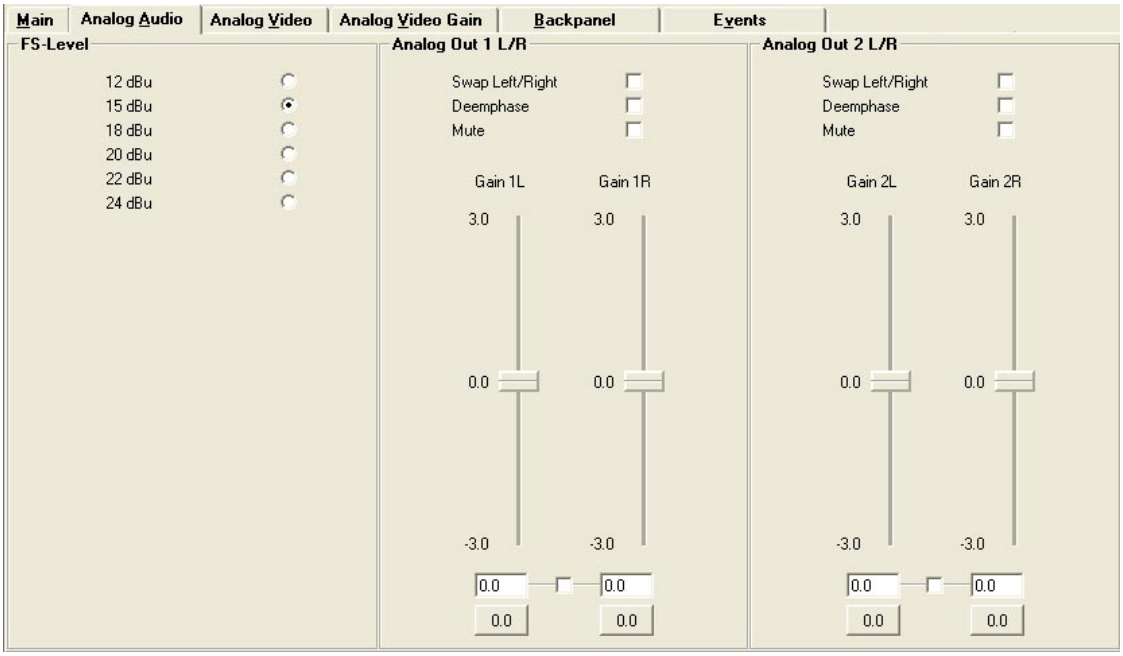


Input Detection
On the left the SDI input is detected and the format displayed on screen (in green)

Deembedder
The first stage is the audio deembedder. The four audio groups are represented by the dark grey boxes and the individual audio signals within each AES channels are shown as being present when highlighted green. This is a good reference for checking embedded audio status on the incoming SD/HDTV SDI stream.

All AES channels (8) are available on an audio crossbar which permits selection of AES channels for the digital and analog audio output stages. (Selected using the radio buttons). Each selected AES stream can be individually muted using the checkboxes provided.

Analog Audio Gain Tab



This GUI screen provides access to all the analog audio adjustments and settings. The gain adjustment provided is +/- 3dB from the selected Full Scale Level (FS Level)

FS Level
This sets the full scale level (scaling) of the analog audio signal. This can vary by region and installation. Please check with your studio engineer what FS level is defined as standard and make the appropriate selection. Default in 18dB (which is typical for European markets)

Analog Out 1 and 2 Left and Right Adjustments
Two identical adjustment panels are provided for the stereo analog audio outputs.

Swap Left and Right – When selected this will swap the left and right channels

Deemphasis – When selected this will apply deemphasis to the audio output.

Mute – When selected this will mute the analog audio outputs (silence)

Gain Adjustments
Adjustable gain is provided via two sliders, one for the right and one for the left channel. These can be moved on screen to the desired settings. The two sliders can be ”ganged” together at any time by selecting the linking checkbox below the sliders. The return the sliders to 0 (null) press the button below the sliders.

> ***Note.*** *The zero or null setting for the sliders will set the audio to the FS level defined. The adjustment provided is +/- 3dB from the selected FS level.*

Reset Factory Defaults

If you are unsure of the settings or have managed to set the module into a strange mode of operation and wish to recover the factory defaults - this can be done by selecting ***Device > Reset Factory Defaults*** from the Device drop down menu at the top of the GUI.

Specifications

Video Input	
Signal Type	Serial Digital Video (SDI) SMPTE 292M, 344M, 259M with automatic input standard detection
Supported Formats	525/59.94Hz 625/50Hz 1080i/59.94Hz/60Hz/50Hz 720P/59.94Hz/60Hz/50Hz
Input Impedance	75 Ω
Input Level	0.8v
Connector	BNC
Return Loss	>15dB (270Mbits) >10dB (1.485Gbits)
Digital Video Ouputs	
Signal	2 x Serial Digital Video (SDI) SMPTE 292M, 344M, 259M
Output Imedance	75 Ω
Output Level	0.8v pp +/- 10%
Return Loss	> 15dB (1.5 Ghz)
Connection	BNC
Jitter	<0.20 UI (270 Mbits) <0.25 UI (1.485Gbits)
Digital Audio Outputs	
Signal	AES3 (balanced)
Impedance	110 Ω
Connectors	25 pin SubD
Mode	Select any 2 AES signals from de-embedded audio (8xAES)
Analog Audio Outputs	
Signal	4 x Balanced analog audio (2 x Stereo L+R)
Connector	25 pin SubD
Dynamic Range	>90dB
Signal to Noise	>85dB
Conversion	24 bit
Output level	-39dB…..+24dB in 0.5dB increments (default 18dB)
Electrical	
Operating Voltage	+ 12 VDC
Power Consumption	6 W
Safety	IEC 950 / EN 60950 / VDE 0805
Mechanical	
Size	283mm x 78mm
Weight	CardModule 150g, connector plate 70g
Ambient	
Temperature	5ºC – 40ºC Maintaining Specifications
Humidity	90% non condensing

Service

Parts List

Due to the very dense design and high level of integration there the module is not user serviceable. Please contact LYNX for repairs or to request an exchange unit.

There is one consumable part used on this module which is the cooling fan. A service kit is available to exchange the fan. Ordering information below.

Part type: ***Cooling Fan Service Kit Series 5000 CardModules***

Technical Support

If you are experiencing problems, or have questions please contact your local distributor for further assistance.

Technical support is also available from our website.

Please do not return products to LYNX without an RMA. Please contact your authorized dealer or reseller for more details.

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

www.lynx-technik.com

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

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