LYNX
TECHNIK AG

Reference Manual

P DX 3312 D

Dual AES & Analog Audio Demultiplexer

Series 3000 MiniModules

Warranty

LYNX Technik AG warrants that the product will be free from defects in materials and workmanship for a period of two (2) years 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
Sandstrasse 7
D-64404 Bickenbach
Germany

Declare under our sole responsibility that the product

TYPE: P DX 3312 D

To which this declaration relates is in conformity with the following standards:
EN 55103-1   /1996
EN 55103-2   /1996
EN 60950   /1997
Following the provisions of 89/336/EEC and 73/23/EEC directives.

Winfried Deckelmann

Bickenbach, January 2003

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 P DX 3312 is a high quality AES and analog Audio de-multiplexer (Audio de-embedder) designed primarily for broadcast and professional applications.

The Module accepts 1 SDI input signal with up to four audio groups embedded. One audio group can be selected and de-multiplexed and output as AES and analog Audio signals on a 110 Ohm SubD25 connection. Two reclocked outputs of the input signal are also provided to cascade several modules if required.

The P DX 3312 has a variety of features, which include:

- User selectable audio groups. (1 through 4)
- Supports 525 / 625 line standards
- Supports 4:3 / 16:9 aspect ratios
- Supports 20 and 24 bit audio
- Supports 8 and 10 bit video
- Auto detect 270 / 360 Mbit operation
- Local DIP-switches and LED's for control and status monitoring
- All settings stored in non-volatile flash ram
- Two reclocked outputs of input video

The module has a built in micro-controller with local controls, status and alarm indicators and well as internal flash ram for storing setups. Any operational parameters configured and stored into the module are recalled when powered up.

The P DX 3312 is part of the 3000 series of MiniModules, which offer high quality, modularity and flexibility in a very small form factor ideal for applications where space is at a premium.

The modules can be used either stand alone using the optional power supply brick, or as part of a tightly integrated space saving system where up to 10 MiniModules can be mounted utilizing the optional LYNX R FR 3005 / 3010 rack housing. This includes integrated power supply and optional redundant power supply.

Functional Diagram

Figure 1 below is the basic functional diagram for the P DX 3312 MiniModule.
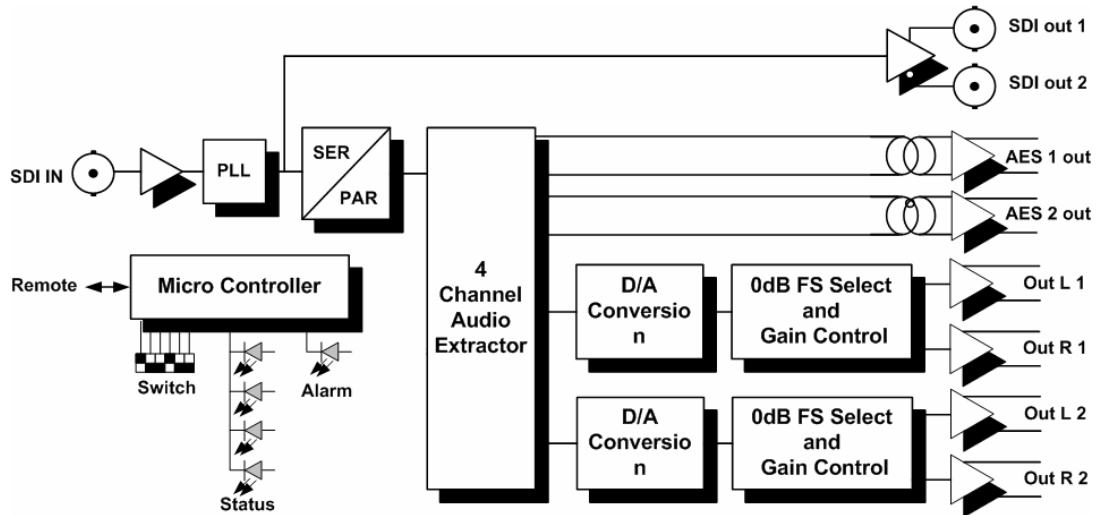
Figure 1- P DX 3312 Functional Diagram

Module Layout

Figure 2 shows the physical layout of the P DX 3312 MiniModule. Video I/O is made through standard 75 Ohm BNC video connections and Audio output through a 110 Ohm SubD25 connector. Module configuration is set via a small dip-switch located behind an access hole in the bottom of the module.

If the module is being used in a stand alone application then the optional power supply (R PS 3001 E, R PS 3001 U or R PS 3001-3) is required to power the module (not shown)
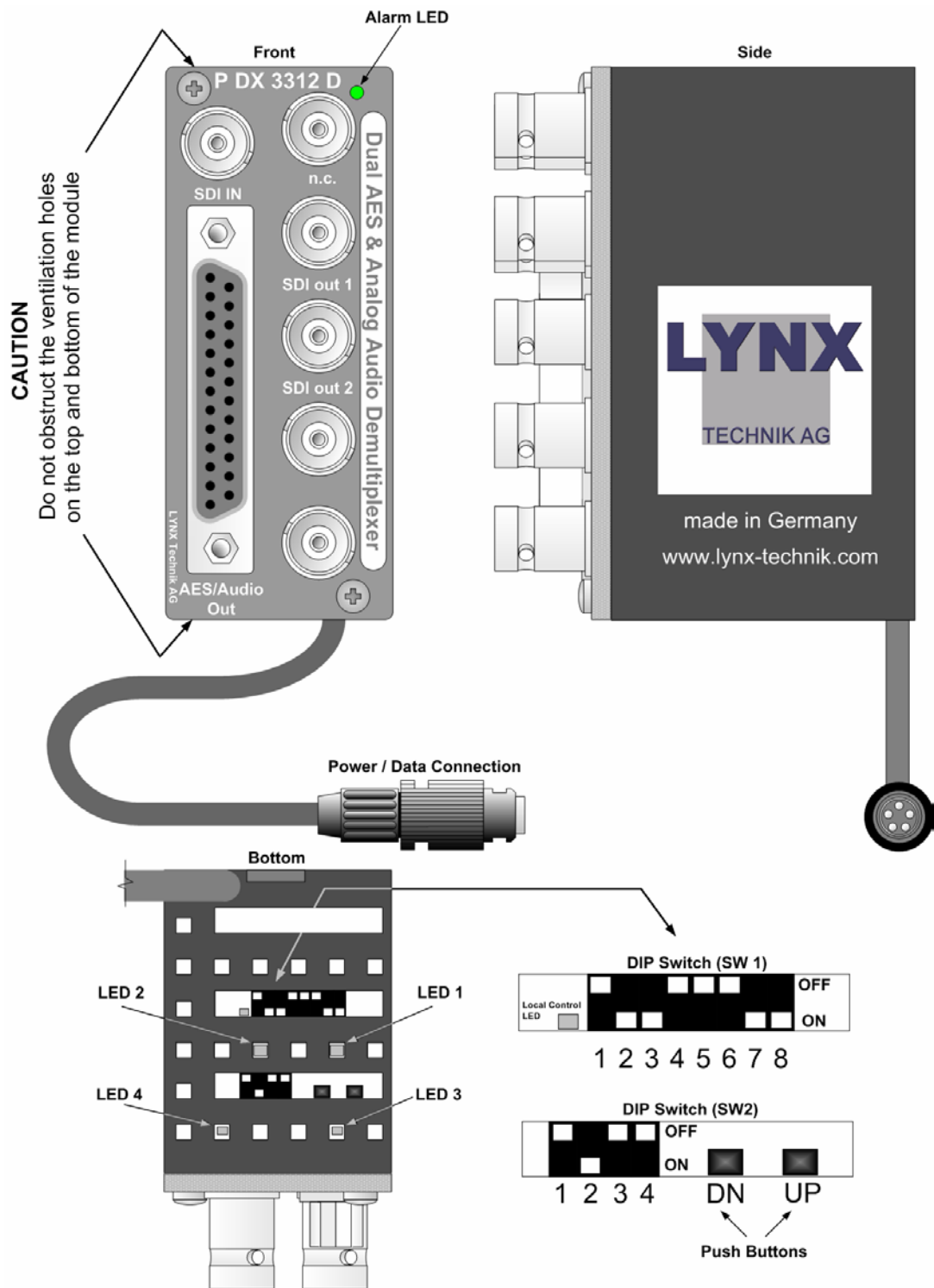
Figure 2 – Module Layout

Connections
Audio / Video Connections

The P DX 3312 MiniModule is configured with standard 75 Ohm BNC connectors for Video I/O. The Audio outputs are provided on a SubD25 connector. Connection is self-explanatory for Video. Audio see below. We recommend the use of high quality video cable suitable for digital video connections to reduce the risk of interference or errors due to excessive cable attenuation.

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

Audio Output Connections (balanced)

SubD 25 pin female connector.

Pin Number	Connection	Pin Number	Connection
1	+ Left 1	14	- Left 1
2	GND Left 1	15	+ Right 1
3	- Right 1	16	GND Right 1
4	+ Left 2	17	- Left 2
5	GND Left 2	18	+ Right 2
6	- Right 2	19	GND Right 2
7		20	
8		21	
9		22	
10	+ AES 2	23	- AES 2
11	GND AES 2	24	+ AES 1
12	- AES 1	25	GND AES 1
13			
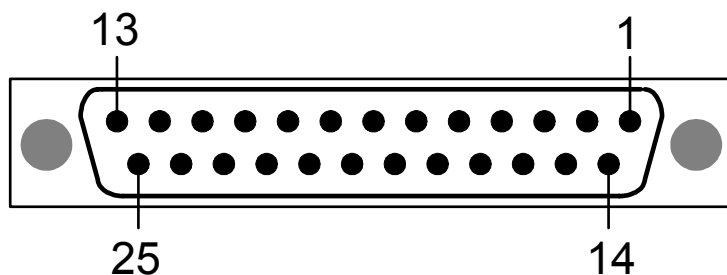
Power Connections

If using the module in a stand-alone application use the separate R PS 3001 E (for Europe), R PS 3001 U (USA) power brick option or the R PS 3001- desk power supply.

DC Power Connector

The MiniModule has a captive power lead fitted to the module, with a male 5 pin locking bayonet connector. This connection provides DC power and also data connectivity to the module. Connector wiring is shown below.

Data Connection   **Power Connection**

i2C-SDA (data)

i2C-SCL (clock)

GND

+ 5V

Male Connector
(view looking into connector from front)
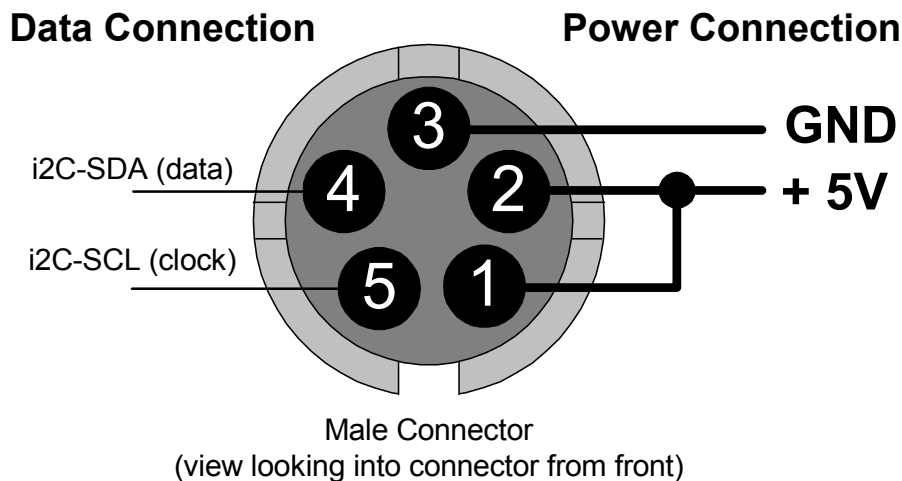
Caution
Only use the optional LYNX R PS power modules. Ensure the 5-pin power connector is locked securely in place.

Installation
Mechanical
Stand Alone Operation

The P DX 3312 MiniModule can be used in a stand alone application. There are two options for the use of the module in this way.

a) Using the R FR 3005 Rack Frame 1 option. This allows up to any 10 of the MiniModules to be secured onto a rack frame assembly for 19 inch rack mounting. This keeps the modules secured, organized and out of the way. The R PS 3001 power brick option or the R FR 3010 option is required to power each module. Please refer to the R FR 3005 Reference Manual supplied with this option for more details.

b) Single Use. The MiniModule can be powered independently with the R PS 3001 option and used in any location where this functionality is required.

!

Caution. Care needs to be taken when using the module in this way, as it is not physically secured. Keep the module away from the floor to avoid the risk of someone stepping or tripping on the unit, and locate the unit away from excessive sources of heat and any sources or moisture.

If using more than one MiniModule in any installation, the R FR 3005/3010 Rack frame combination is highly recommended.

Multiple Units

Most applications will require more than one MiniModule, which can include any of the available Series 3000 MiniModule product range. There are two options for mounting multiple units.

a) Using the R FR 3005 Rack Frame option. This allows up to any 10 of the MiniModules to be secured onto a rack frame assembly for 19 inch rack mounting. The R PS 3001 power brick option or the R FR 3010 option is required to power each module. Please refer to the R FR 3005 Reference Manual for more details.

b) Using the R FR 3010 Rack frame extension option. Can be combined with the R FR 3005 Rack frame option. Each module plugs into a connection bus, which provides common power for all modules. (no R PS external power supplies are needed). Please refer to the respective reference manuals for these options for details of mechanical installation.

The very small size and density of the MiniModules combined with the available rack frame options allows the addition of a complex and custom signal distribution system without taking any additional front rack space. The rack frames are designed for installation in the back of 19-inch racks where there is normally plenty of available space. Ideal for mobile truck installations and facility expansions where space is at a premium.

Electrical Installation.

Stand Alone Operation

The MiniModule requires the R PS 3001 power brick option for stand-alone operation. Three versions are available R PS 3001 E for European markets, R PS 3001 U for the US markets and the R PS 3001-3 desk power supply. Please ensure you have the correct power option for your region. The connection to the module is made with a small 5-pin connector, which has a twist bayonet securing system. Please make sure the connection is solid and locked in place. A strain relief is included within the module to prevent excessive strain on the connection.

Signal connections should be made with care, please ensure connections are correct and compatible equipment is feeding / receiving the signals from the module or damage can result.

Caution. Only use the optional LYNX R PS 3001 power modules. Ensure the 5-pin power connector is locked securely in place.

Caution. Care needs to be taken when using the module in this way, if it is not physically secured. Keep the module away from the floor to avoid the risk of someone stepping or tripping on the unit, and locate the unit away from excessive sources of heat and any sources or moisture.

Settings and Control

The P DX 3312 is configured via the integral 8-position dip-switch (SW1), the 4-position dip-switch (SW2) and the two push buttons. This is located on the bottom of the module and can be accessed through the cutout provided (fig 2)

Switch Settings

Dip Switch 1 (SW1)

Below the switch settings for the 8-position dip-switch are defined. Please see the section following the table for more detail on the switch function.
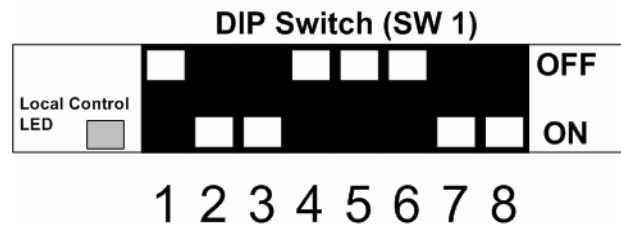
Switch	Setting	Function SW 1
1	ON	Local adjustment enabled
	OFF	Local adjustment disabled
2	ON	Audio Group 1 Select
	OFF	
3	ON	Audio Group 2 Select
	OFF	
4	ON	Audio Group 3 Select
	OFF	
5	ON	Audio Group 4 Select
	OFF	
6	ON	Audio Mute ON
	OFF	Audio Mute OFF
7	ON	Not used
	OFF	
8	ON	Not used
	OFF	

Switch Function Detail SW 1

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.

*There is a small LED next to dip switch position 1.This LED must be **ON** [green] before any local configuration changes to the dip switch will be recognized by the module. If Switch 1 is already set to **ON** [enable local adjustment] but the LED is **OFF** then toggle switch 1 **ON-OFF-ON** to enable local control.*

Dip Switch 2 through 5

These switches are used to select the audio groups for de-embedding from the incoming SDI video stream. **ON** selects the Audio group, and **OFF** deselects.

If no audio group is selected then no audio will be de-multiplexed.

This module can only de-multiplex a single audio group. If more than one audio group is selected then by default group 1 will be de-multiplexed.
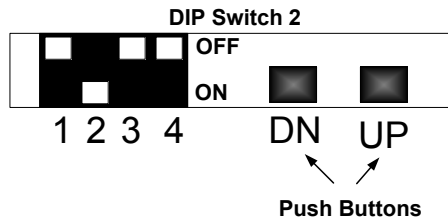
Dip Switch 6

This is used to select Audio mute ON / OFF. Selecting **ON** will mute any audio output from the module

Dip Switch 7 and 8

These switches are not used.

Dip Switch 2 (SW2)

Below the switch settings for the 4-position dip-switch are defined. Please refer to figure 2 for the location of the switch. Located either side of the switch are two push buttons [UP/DN] these are for gain adjustments.

Note. The module dip Switch is not a usual implicit selection switch used to define simple functionality. Setting the module is an interactive process, which involves setting the switch state to enable the setting or adjustment of a certain parameter, and then storing settings in flash memory. Switch function is shown in the table below, descriptions of the switch settings are provided in the next section.

Switch 2	Setting	Function
1	ON	High FS range (18dBu or 24dBu)*
	OFF	Low FS range (12dBu or 15dBu)*
2	ON	If Switch 1 = *low range* then FS = 15dBu If Switch 1 = *high range* then FS = 24dBu
	OFF	If Switch 1 = *low range* then FS = 12dBu If Switch 1 = *high range* then FS = 18dBu
3	ON	Adjust gain for AES channel 2
	OFF	Adjust gain for AES channel 1
4	ON	Set gain for selected channel on Switch 3 to unity (0dB)
	OFF	Normal operation

* Range depends on the setting of Switch 2

Switch Function Detail SW2

Switch 1 – This switch is used to select either high or low full scale (FS) gain range for the module. Selecting **ON** will set the high FS range which can be either 18 or 24 dBu (depending on the setting of Switch 2) Selecting **OFF** will set low FS range which can be either 12 or 15 dBu (depending on the setting of Switch 2)

Switch 2 – This is used in conjunction with Switch 1 and will select one of the two possible values determined by the setting of Switch 1. (Refer to table on previous page)

Switch 3 – This switch is used to select the AES channel for gain adjustment. **ON** selects channel 2 **OFF** selects channel 1. Gain is adjusted using the [**UP/DN**] push buttons *

Switch 4 – This switch is used to set unity gain on the channel selected using switch 3. **ON** will set unity gain* **OFF** will provide for adjustment of gain.

* When the settings have been made wait 10 seconds for the new value to be stored into flash ram, seen by the alarm LED flashing yellow four times.

Factory Preset Condition

The P DX 3312 is delivered preset for the following mode of operation:

- Audio Group 1 selected
- Audio Mute **OFF**
- Full Scale (FS) Range LOW
- Full Scale = 15dBu
- Normal operation

If this is the mode of operation required, then no adjustments are necessary.

Alarm/LED Status Indicators

The P MX 3312 module has built in LED indicators, which serve as alarm and status indication for the module. Function is described below. The Indicators are found on the bottom of the module and can be seen through the access holes provided. (Figure 2)

Module Edge Status LEDs

4 Status LEDs are provided on the module edge
LED 1 = AES Channel 1
LED 2 = AES Channel 2

LED Color	Indication
Green	AES signal present, no errors
Yellow	AES signal present, muted
Red	AES signal not present

Channel Condition Indicators

One LED is provided for each channel **LED 3 = Channel 1** and **LED 4 = Channel 2**

LED Color	Indication
Green	Digital Audio OK
Yellow	Digital Audio parity error
Red	Digital Audio input missing

Front Panel Alarm Indicator

There is also a single alarm LED on the front side of the module, which is designed for quick and easy indication of a problem condition in installations where visible access to the bottom of the module is not convenient.

LED Color	Indication
Green	SDI with two AES signals in selected group present
Yellow	SDI present, but only one AES in selected group
Red	No SDI signal or no Audio present

LED **OFF** indicates power is lost, or there is a power supply fault.

Specifications *(P DX 3312 D)*

Inputs

SDI Video	1 x Serial Digital Video. SMPTE 259M-C
Input impedance	75 Ohm (BNC connectors)

Outputs — Video

Signal (Video)	2 reclocked Serial Digital Video. SMPTE 259M-C
Output impedance	75 Ohm (BNC connectors)
Output level	0.8V p-p
Cable Equalization	> 250m (Belden 8281 / 270Mbit/s)
Jitter	< 0.2 UI
Return loss	> 15dB (270 MHz)

Outputs — Digital Audio

Signal (DigitalAudio)	2 x AES3, 24 Bit
Output impedance	110 Ohm (balanced) (SubD25 female connector)
Output level	4V p-p nominal.

Outputs — Analog Audio

Signal	2 x balanced stereo outputs (one stereo output per channel)
Impedance	50 Ohm (SubD25 female connector)
Max Level	24 dBu into 10K Ohms
0dB FS level	Selectable (12dBu, 15dBu, 18dBu or 24dBu)
Gain	Adjustable between -90dB to 6dB (in 0.5dB incr.)
Quantisation	24 bits
Noise Floor	< -90 dBu (A-weighted)
Distortion	< 0.002% (20 Hz to 20 KHz)
Frequency Response	+\- 0.2dB (20 Hz to 20 KHz)
Crosstalk	< -90dB (20 Hz to 20 KHz)
Added jitter	< 2ns

Electrical Specifications

Operating Voltage	+ 5V DC
Power Consumption	6 W
Connection	DC input via 5 pin locking bayonet connector
Safety	IEC 950/ EN 60950/VDE 0805

Mechanical

Size	85.5mm x 35.3mm x 58mm + connectors
Weight	350g

Ambient

Temperature	5°C to 35°C Maintaining specifications -20°C to +70°C Storage
Humidity	Max. 80% non condensing

Supplied Accessories

Documentation	P DX 3312 D Reference Manual and Quick Reference Guide

Available Options

Below is a list of available options for the P DX 3312 MiniModule. Please refer to product brochures or our web site for more detailed information.

Model	Description
R PS 3001 E	**External brick power supply module for Series 3000 MiniModules. European market version. 100-240 VAC input, +5V DC output.**
R PS 3001 U	**External brick power supply module for Series 3000 MiniModules. USA market version. 110-240 VAC input, +5V DC output.**
R PS 3001-3	**External desk power supply module for Series 3000 MiniModules. 110-240 VAC input, +5V DC output.**
R FR 3004	**Mounting Support for 4 MiniModules**
R FR 3005	**Rack Frame 1. This is a basic 19 inch rack mountable frame which can accommodate 10 MiniModules with power bricks R PS 1 or can be extended with the R FR 3010.**
R FR 3010	**Rack Frame 2. This is a card cage with integrated central power supply and optional redundant power supply, which can accommodate 10 MiniModules. Can be combined with R FR 3005**
R PS C15	**1.5m cable extension to connect one MiniModule to R FR 3010**
R PS C25	**2.5m cable extension to connect one MiniModule to R FR 3010**
R PS 5010	**Redundant power supply for the R FR 3010 card cage**

Parts List

Due to the very dense design and high level of integration there are no user serviceable electronic assemblies within the P DX 2312 module.

P DX 3312 D Mini Module (complete)

Description	Dual Analog Audio Demultiplexer
Model Number	P DX 3312 D
Part Number	6.155.002.255

Service

If you are experiencing problems, or have questions concerning your P DX 3312 MiniModule please contact your local distributor for assistance.

We offer a fixed cost service exchange program for defective Series 3000 MiniModules 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 64331 Weiterstadt Germany.
Phone	+ 49 (0) 6150 1817 0
Fax	+ 49 (0) 6150 1817 10
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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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