

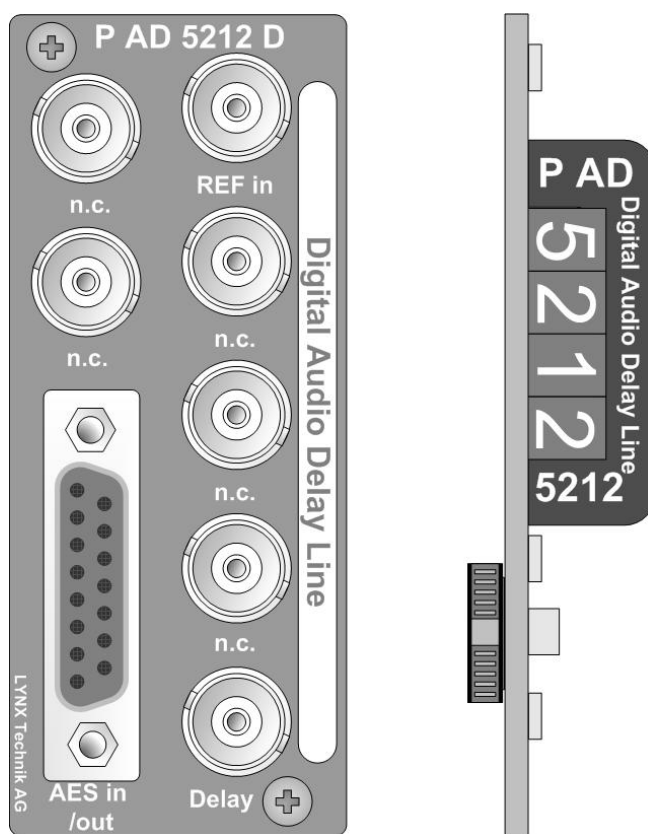
Version 1.0

Reference Manual

P AD 5212 D

Digital Audio Delay Line

Series 5000
CardModule



© LYNX Technik AG
Brunnenweg 3
D-64331 Weiterstadt
Germany
www.lynx-technik.com

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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.

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Regulatory information

Europe

Declaration of Conformity

We	LYNX Technik AG Brunnenweg 3 D-64331 Weiterstadt Germany
<i>Declare under our sole responsibility that the product</i>	
TYPE: P AD 5212 D	
<i>To which this declaration relates is in conformity with the following standards (environments E1-E3):</i>	
EN 55103-1 /1996	
EN 55103-2 /1996	
EN 60950 /2001	
<i>Following the provisions of 89/336/EEC and 73/23/EEC directives.</i>	
	Winfried Deckelmann
Weiterstadt, October 2004	
<i>Place and date of issue</i>	<i>Legal Signature</i>

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

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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 AD 5212 D is a high quality digital audio delay line designed primarily for broadcast and professional applications.

The two available AES inputs can be delayed up to a maximum of 10 sec in 1 ms steps. A delay input is provided for automatic external delay tracking.

The P AD 5212 D features a wide range of available adjustments (via optional Rack Controller). Basic adjustments are possible using the local multi-function switch and integrated display.

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.

Key Features

- 2 x AES 3 inputs (balanced on Sub D)
- External tracking delay input (on BNC connector) with up to 320ms variable delay time
- Output can be synchronized to Video reference
- Sampling rates of 32kHz, 44.1kHz, 48kHz or 96kHz supported
- 10 sec max. delay per channel
- Outputs can be assigned to inputs independently
- Local Multi function switch, Matrix display and LED's for local control and status monitoring
- Microprocessor controlled with local display and menu driven user interface
- Flash Ram storage for settings
- Remote control interface

Functional Diagram

Figure 1 below is the basic functional diagram for the P AD 5212 D CardModule.

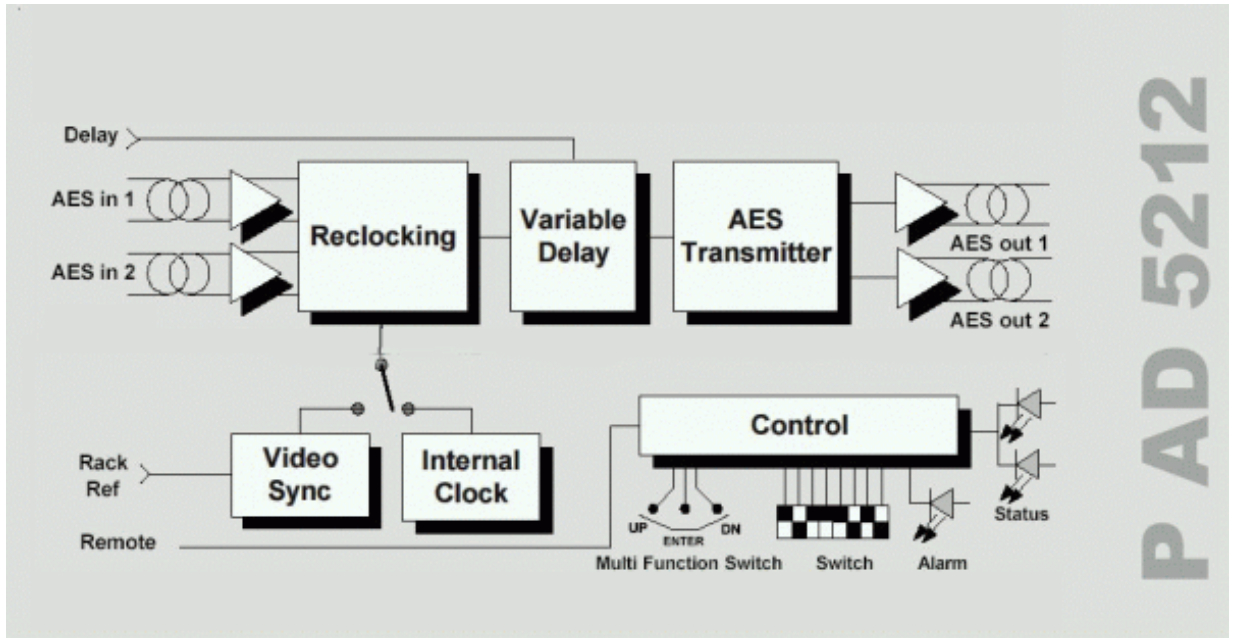


Figure 1- P AD 5212 D Functional Diagram

Module Layout

Figure 2 shows the physical layout of the P AD 5212 D CardModule and also the connection panel which is fitted to the rear of the rack.

PCB Layout



Rear Connection Panel



PCB Front View

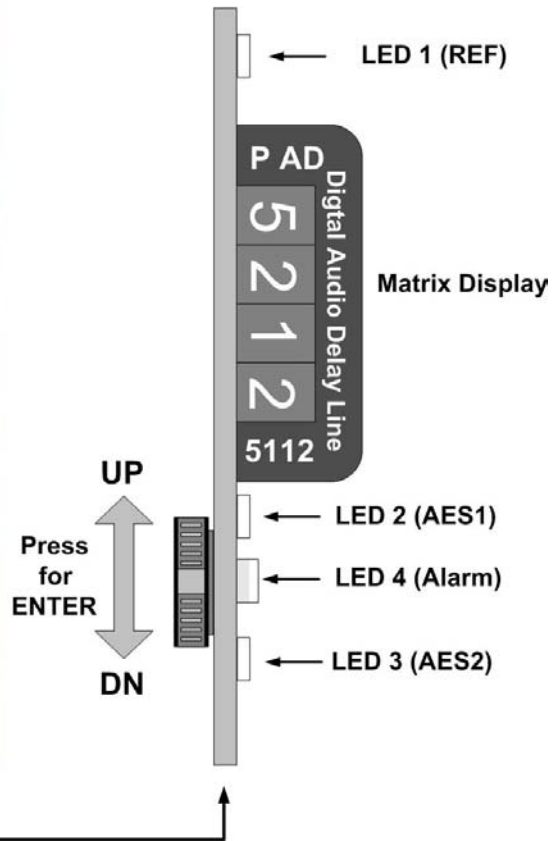


Figure 2: Physical layout P AD 5212 D

Connections

Video and Delay

The P VD 5212 D CardModule is configured with standard 75 Ohm BNC connectors for the video reference and the delay input. Connection is self-explanatory. We recommend the use of high quality video cables to reduce the risk of interference or errors due to excessive cable attenuation.

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 Connections

The P AD 5112 D CardModule is configured for Sub D 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 Connector (balanced)

SubD 15-pin female connector

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

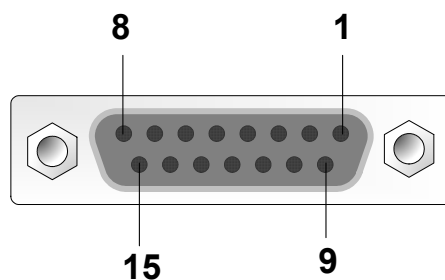
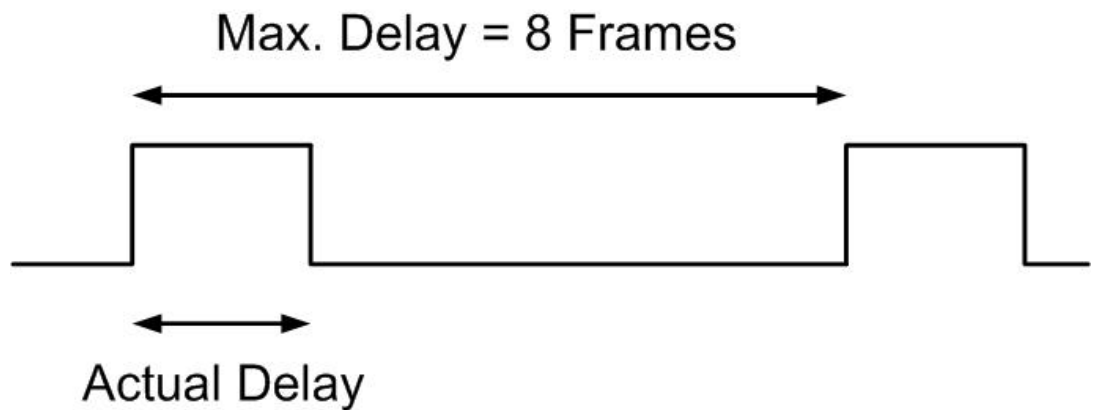


Figure 3 - Audio connection detail

Audio Delay Pulse

The Audio Delay Pulse is connected through a BNC (75 Ohm) connector with TTL levels.

Below is an example for the delay pulse coming from a LYNX Frame Synchronizer



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 P AD 5212 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 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.

PCB Front View

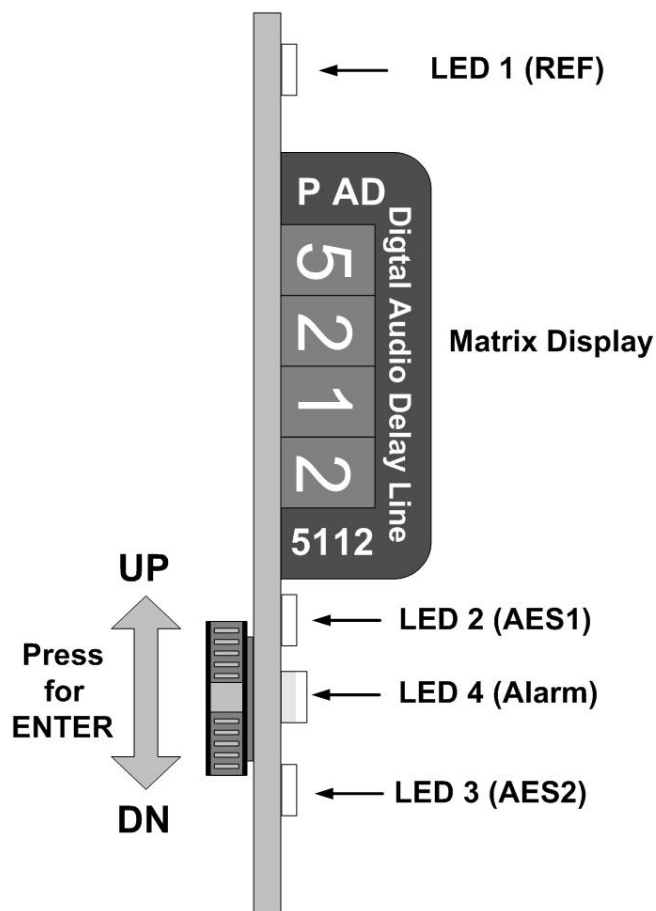
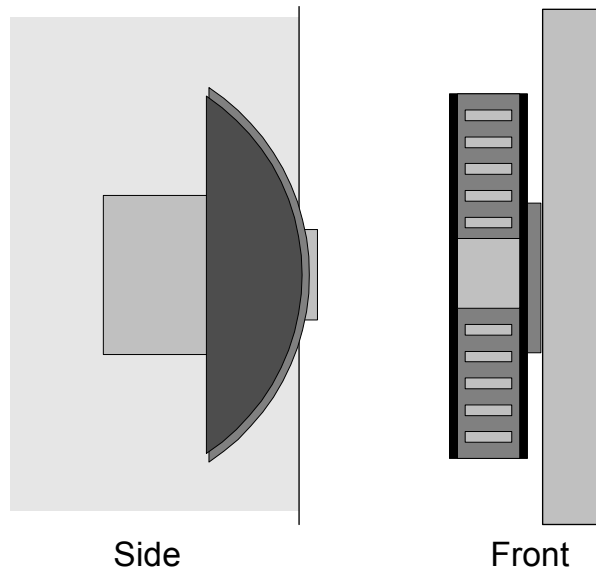


Figure 4 – Switch and Display Location

Multi Function Switch

The CardModule is equipped with a multi-function switch located on the front bottom edge of the card (refer to figure 4)

Multi-function Switch



Switch Operations

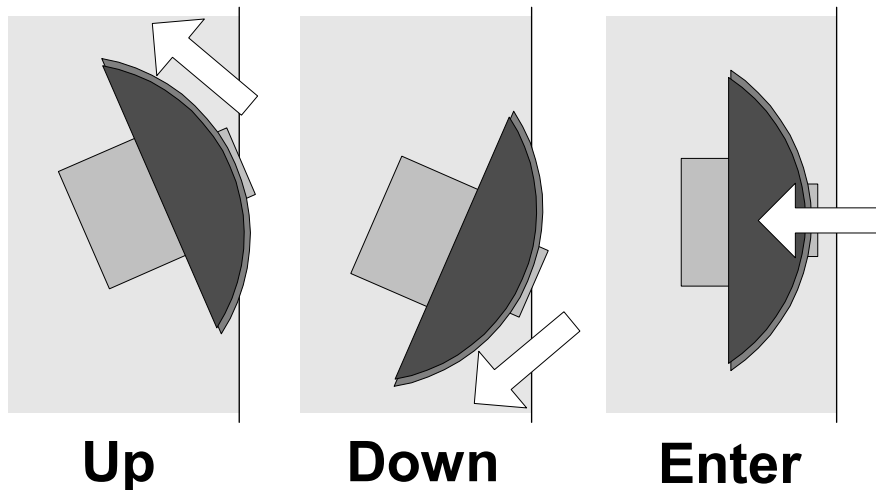


Figure 4 – Switch Operation

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 (figure 3). 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.

Navigation

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.

Notes / Tips.

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.

ROOT	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	COMMENTS
5212	IN	AES1	BSRC	OFF ON back	"Normal" Root display on module = Module type
		AES2	SWAP	OFF ON back	Sample Rate Converter (SRC): ON: Bypass SRC OFF: SRC active
			MUTE	OFF ON back	Swap Left and Right Channel
			back		Mute AES1 / AES 2
		SFRQ	32 44.1 48 96 back		Select Sample Rate
		REF	INT EXT back		
		back			

PROC	AES1	DLAY	0000	Adjust Delay for AES 1 resp. AES2: 20..20,000 ms					
	AES2	DLAY	OFF	Apply dynamic delay pulse					
			ON						
			back						
		MUTE	OFF	MUTE if no delay pulse present					
			ON						
			back						
		back							
OUT	OUT1	AES1		Assign AES stream to Output1					
		AES2							
		back							
	OUT2	AES1		Assign AES stream to Output2					
		AES2							
		back							
		back							
RSET	YES			Restore factory defaults					
	NO								
	back								
back									

Factory Preset Condition

The P VD 5212 is delivered programmed and preset for the following mode of operation:

Video Reference:	INTERN (Rack Ref)
Sampling Frequency:	48 kHz
Sample Rate Converter:	Bypass OFF
Delay:	0 sec
AES Out 1:	AES in 1
AES Out 2:	AES in 2
Dynamic Delay:	OFF

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

These settings can be recalled at any time by selecting reset from the menu system.

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 alarm LED flashing yellow four times.

Alarm/LED Status Indicators

The P AD 5212 D module has integral LED indicators, which serve as alarm and status indication for the module. Function is described below.

Status Indicators

3 status LED`s are provided on the PCB, LED 1, LED 2, LED 3 (Figure 3)

LED	Color	Indication
1	Green	Reference present
	Red	Reference missing
2	Green	AES 1 Input present
	Red	AES 1 Input missing
3	Green	AES 2 Input present
	Red	AES 2 Input missing

Alarm Indicator

There is also a single alarm LED on the lower edge of the module LED 4. This is visible through the card frame front cover and provides a general indication of the module status.

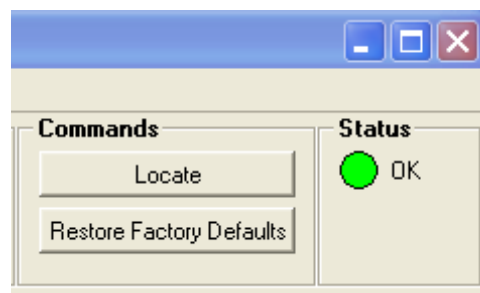
LED Color	Indication
Green	Both AES and Reference present
Yellow	One AES or Reference missing
Red	Both AES missing

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

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 alarm LED will flash yellow in the following continuous sequence.

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

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 *(P AD 5212 D)*

Reference Input

Signal	Composite analog sync, 525/60Hz or 625/50Hz
Detection	Automatic
Connection	BNC
Impedance	75 Ohms

Delay Input

Signal	TTL pulse duty cycle = delay from input to output
Connection	BNC, 75 Ohm

Audio Inputs

Signal	2x AES3 balanced transformer isolated inputs
Connection/Impedance	SUB D/110 Ohms
Return Loss	>25dB (32KHz to 100KHz)

Audio Outputs

Signal	2 x AES3 balanced transformer isolated outputs
Connection/Impedance	SUB D/110 Ohms
Output Level	4.0v p-p (nominal)

Performance

Adjustment range	Tracking Delay up to 8 video frames Additional fixed delay up to 10 sec.
Control	Local display and multi-function switch and via remote when using a rack controller and LYNX control software.

Electrical Specifications

Operating Voltage	12 VDC
Power Consumption	5 W
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	P AD 5212 D Reference Manual
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Available Options

Below is a list of related products for the P AD 5212 D 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 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.

P AD 5212 D CardModule (complete)

Description	Digital Audio Delay Line
Model Number	P AD 5212 D
Part Number	5.155.007.770

Sub Assemblies:

P AD 5212 D Processing Board only (BS 5012 L)

Part Number	5.155.007.795
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Rear Connection Panel for P AD 5212 D (MA 5005)

Part Number	5.155.007.265
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Service

If you are experiencing problems, or have questions concerning your P AD 5212 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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