



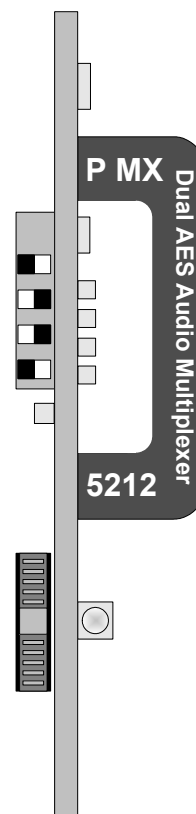
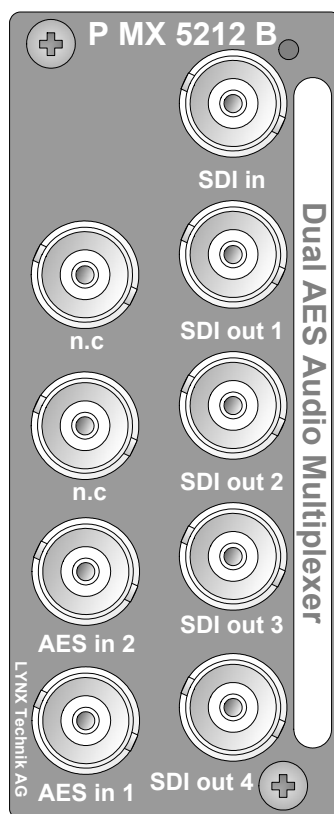
Version 1.0

Reference Manual

P MX 5212 B

Dual AES Audio Multiplexer

Series 5000
CardModule



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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 MX 5212 B	
<i>To which this declaration relates is in conformity with the following standards:</i>	
EN 55103-1 /1996	
EN 55103-2 /1996	
EN 60950 /1997	
<i>Following the provisions of 89/336/EEC and 73/23/EEC directives.</i>	
	Winfried Deckelmann
Weiterstadt, June 2003	
<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 MX 3212 B is a high quality digital AES Audio multiplexer (Audio Embedder) designed primarily for broadcast and professional applications.

The Module accepts 2 external AES3 id inputs (combined into one audio group) and multiplexes these into the incoming SDI video input. Group insertion is selectable (1 through 4). Four separate SDI outputs of the video, with embedded audio are provided. Existing audio groups can be overwritten, deleted or passed transparently. Four separate SDI outputs of the embedded signal are provided which could be used to cascade several modules for additional audio group insertion. The Module uses standard 75-Ohm (BNC) interconnections.

The P MX 5212 has a variety of features, which include:

- User selectable audio groups. (1...4)
- 525 and 625 line standard. (auto detect)
- Supports 4:3 / 16:9 aspect ratios.
- 270 and 360Mbits/s (auto detect)
- Supports 20 and 24 bit audio.
- Supports 8 and 10 bit video.
- Selectable bypass of audio sample rate conversion

- EDH insertion back into outgoing SDI data streams.
- Video to green if SDI input lost.
- No audio insertion if audio input lost.
- Supports asynchronous and synchronous audio inputs. (Asynchronous audio between 30KHz and 48KHz)
- local DIP switch, multifunction switch and LED's for control and status monitoring.
- Microprocessor controlled.
- Remote control interface.

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. Remote control and remote status monitoring is possible when used with the rack frame option and host controller.

CardModules are installed in the series 5000 card frame (R FR 5010) 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 P MX 5212 B CardModule.

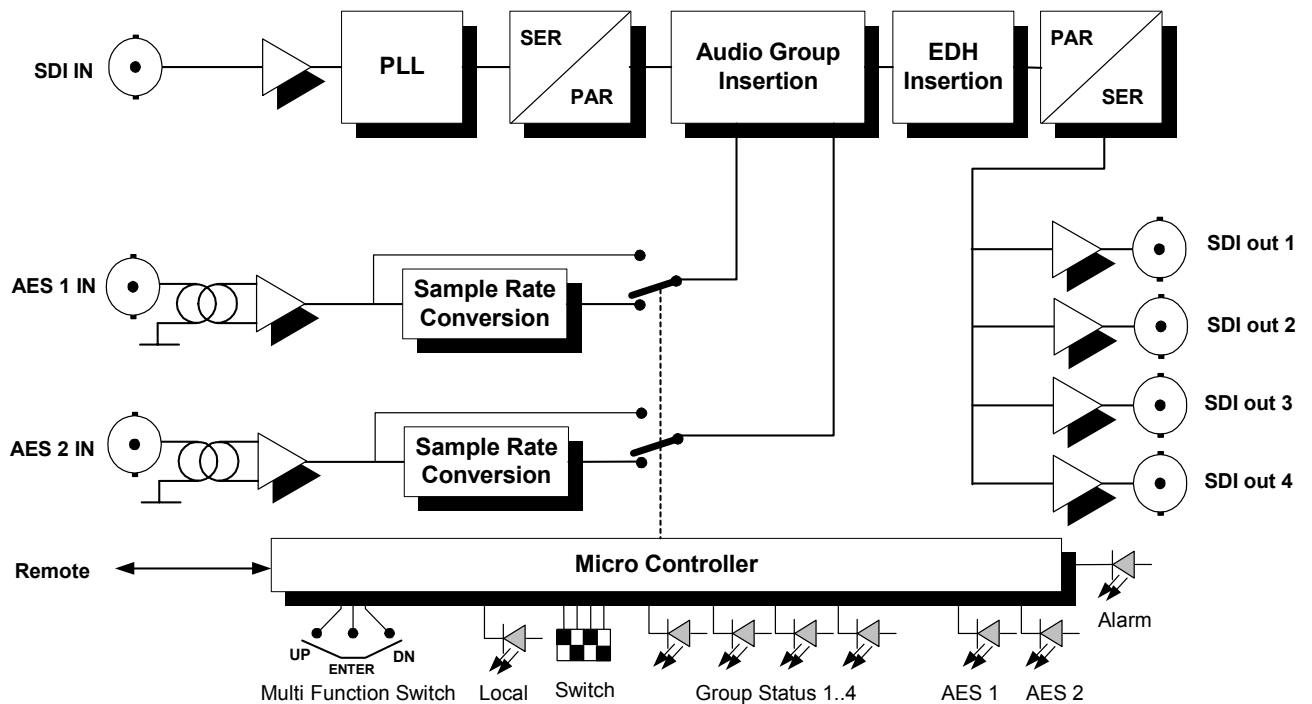


Figure 1- P MX 5212 B Functional Diagram

Module Layout

Figure 2 shows the physical layout of the P MX 5212 B CardModule and also the connection panel that is fitted to the rear of the rack.

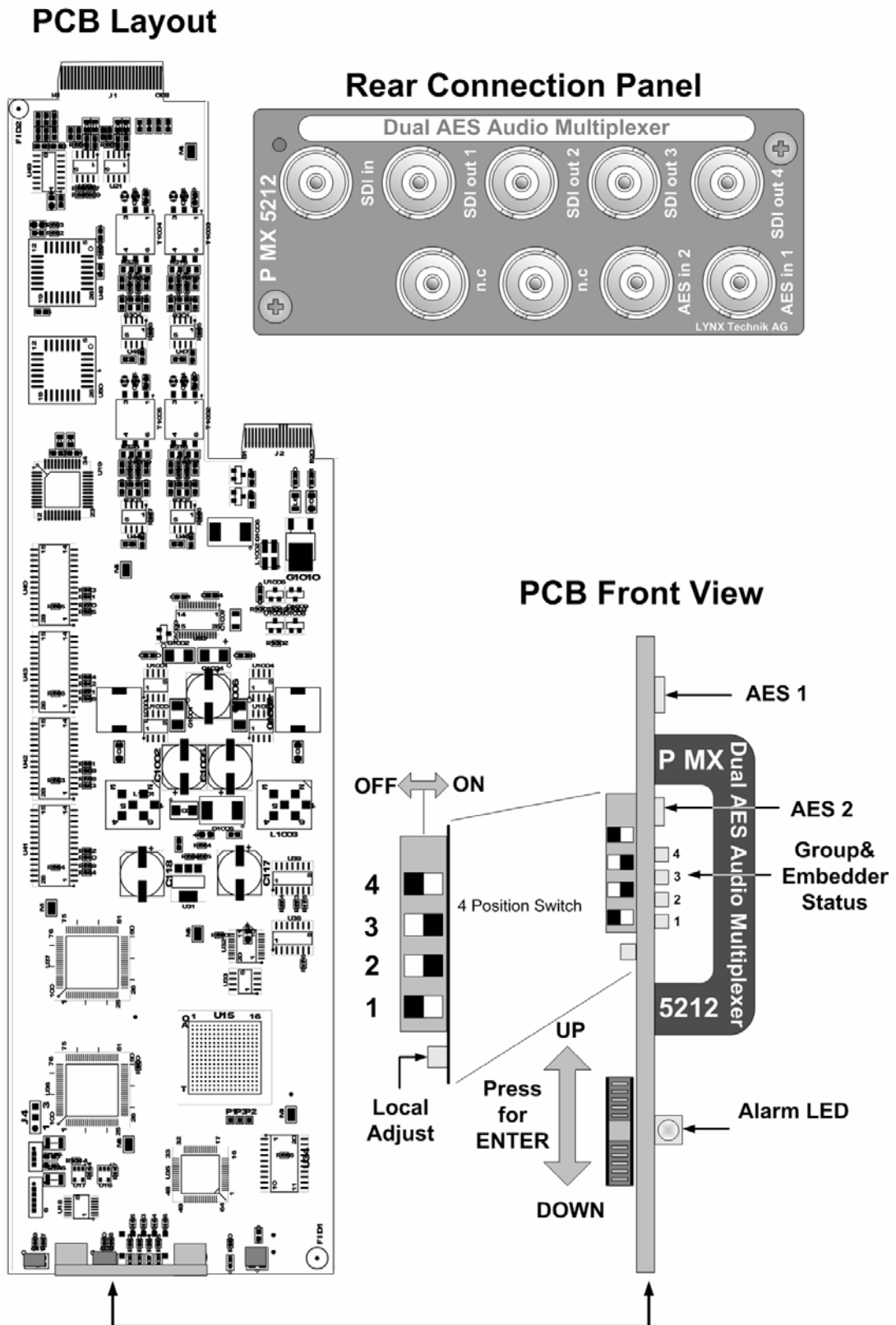


Figure 2 – Module Layout



Caution

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

Connections

Video Connections

The P MX 5212 B CardModule is configured with standard 75 Ohm BNC connectors. Connection is self-explanatory. We recommend the use of high quality video cable for digital audio/video connections to reduce the risk of interference or errors due to excessive cable attenuation. Some guidelines for max cable length are shown below.

250m (820 feet) Belden 8281 (270Mbits/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.

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 MX 5212 B has an integrated micro-controller, which enables the module to be configured and controlled locally using the multifunction 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.

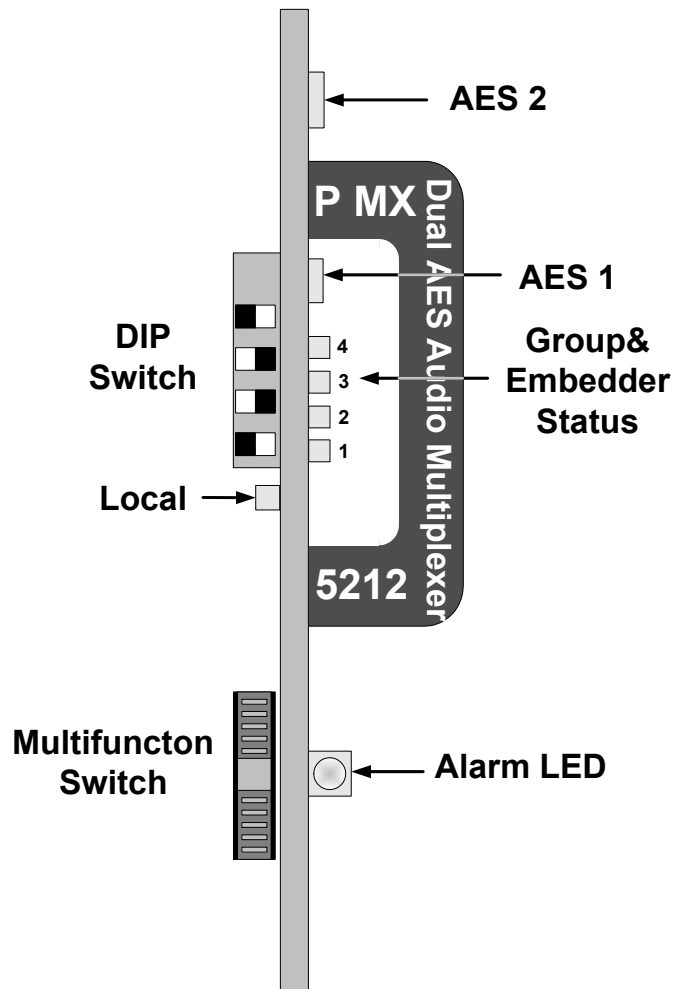


Figure 3 – Switch / LED Locations

Multi Function Switch

The CardModule is equipped with a multi-function switch located on the front bottom edge of the card (see Fig 3/4). The Dip-switch is used to enable the use of the Multifunction switch.

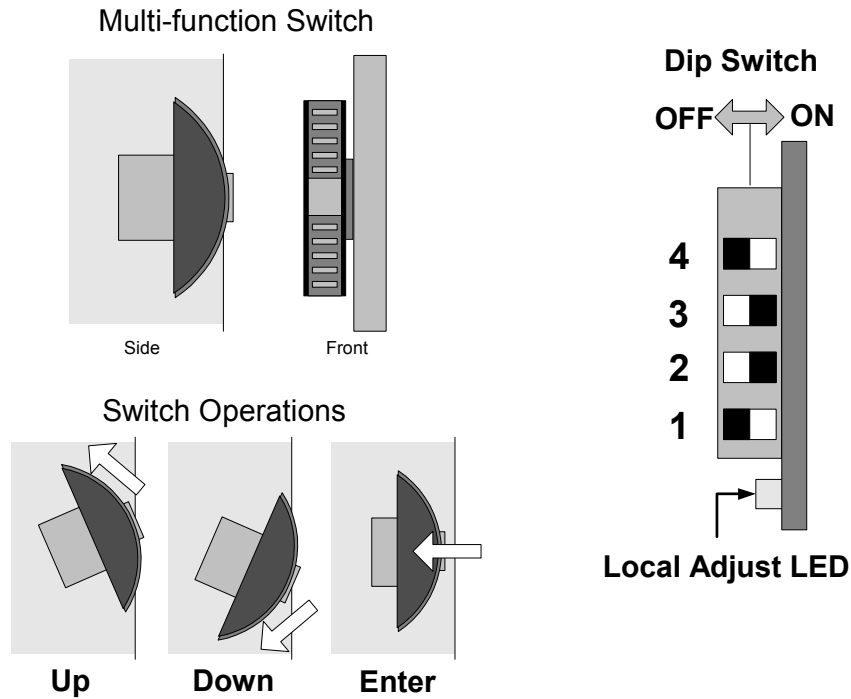


Figure 4 – Switch Operation

Dip Switch Settings

Below the switch settings for the 4-position dip-switch are defined. Please see the section following the table for more detail on the switch function.

Switch	Setting	Function
1	ON	Local adjustment enabled
	OFF	Local adjustment disabled
2	ON	24 Bit AES embedding
	OFF	20 Bit AES embedding
3	ON	Clears (deletes) all incoming audio groups
	OFF	Only replaces selected group
4	ON	Sample rate conversion ON (48KHz)
	OFF	Bypass sample rate conversion

Switch Function Detail

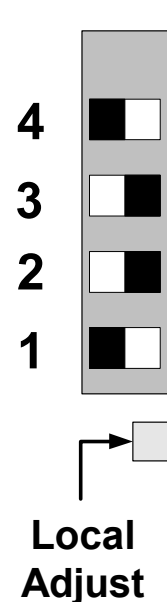
All settings are stored in Flash Ram inside the module (see Auto Store section in this manual). Settings will be recalled on power up.

Dip Switch 1

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

Note.

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



Dip Switch 2

20 / 24 bit operation. When set to **ON** the AES audio output will be 24 bits wide (which is normal). When set to **OFF** the AES audio output can be set to 20 bits, which is sometimes necessary for downstream equipment which may not be compatible with 24 bits operation.

Dip Switch 3

Delete embedded audio. When set to **ON** this will delete **ALL** incoming AES audio signals on the input SDI signal (if any). When set to **OFF** only the

channels selected for embedding will be overwritten. Any remaining audio, which was present on the incoming SDI signal will pass transparently.

Dip Switch 4

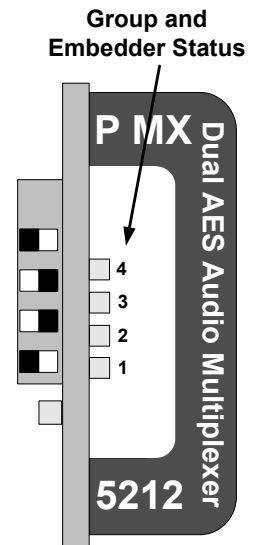
Sample rate conversion ON/OFF. This is used to select sample rate conversion for the module. This setting applies both input audio signals. When set to **ON** (asynchronous) all incoming audio will be sample rate converted to 48 KHz. (input range 30KHz to 48KHz). When set to **OFF** the sample rate conversion will be bypassed. If bypassed, all incoming audio must be synchronous to the input SDI signal. This is useful if the module is to work with Dolby audio data where the audio should not be resampled.

Selecting Audio Group for Embedding

It is possible to select one of the four available groups in the incoming SDI video stream for embedding.

The following procedure can be used to select the group for embedding:

1. Enable local adjustment by Dip switch position 1 to **ON**. Confirm the local adjust LED is **ON** below the switch. If not toggle dip switch 1 **ON/OFF /ON** to enable local adjustment.
2. Using the multifunction switch move up and down to select the required audio group for embedding using the *Group LEDs*.
3. Pressing **Enter** on the Multifunction switch will indicate the status of the embedding operation in the selected group. This is indicated with various states of the LED. See table below



LED State	Indication
OFF	No Audio present in selected group and none is being embedded
Double Flash	Audio is already present in the selected group
Single Flash	Audio group removed from SDI signal without re-embedding it.
Blinking	Audio group is being overwritten by the embedder
ON	Audio group is being inserted by the embedder

4. Return Switch 1 to **OFF** when complete

Additional Remote Functionality

This module is complex in nature and the local controls are only be used to set almost all functionality. There is an extended set of features that are only accessible from remote using the LYNX control system and LYNX Software. Additional functions include:

- Group 4 handling*
- AES presence signaling on Alarm LED**

* When set to **ON** : Group 4 can be used if 24 bit AES is selected and SDI is 625. When set to **OFF**: Group 4 cannot be used if 24 bit AES audio is selected (default)
(with 525 SDI, only three 24 bit groups can be embedded)

**The function of the Alarm LED can be changed to indicate the following:

ON = enables a yellow alarm LED to indicate only one AES group is present and embedding (default)

OFF = Alarm LED green if at least one AES group is present on incoming SDI signal

Factory Preset Condition

The P MX 5212 B is delivered preset for the following mode of operation:

Switch 1

1. **ON**: Local adjustments enabled
2. **ON**: 24 bit AES
3. **OFF**: Only replace audio group selected
4. **OFF**: Sample rate conversion bypassed

Alarm/LED Status Indicators

The P MX 5212 B module has several LED indicators on the card edge that serve as alarm and status indication for the module. The alarm indicator is visible with the cover fitted to the rack. LED functions are described below. Refer to fig 3 for locations.

AES Status Indicator

One LED is provided for each AES channel (AES 1 and AES 2) and indicate the following

LED Color	Indication
Green	AES Present
Red	No valid AES signal present

Group LEDs

Four dual mode LEDs are used for Audio group indication and embedder status indication.

Group Selection Mode

Moving the multifunction switch up and down will cycle the LEDs through the four available groups. LED **ON** indicates the group is selected.

Embedder status mode

Pressing ENTER on the Multifunction switch when the desired group has been selected will change the LED to indicate the current embedder status. See table below.

LED State	Indication
OFF	No Audio present in selected group and none is being embedded
Double Flash	Audio is already present in the selected group
Single Flash	Audio group removed from SDI signal without re-embedding it.
Blinking	Audio group is being overwritten by the embedder
ON	Audio group is being inserted by the embedder

Alarm Indicator

A Single alarm LED is provided which can be seen while the rack cover is fitted and provides a general alarm indication for the module.

Color	Indication
Green	SDI present with two AES signals detected
Yellow	<ul style="list-style-type: none">• SDI present with one AES signal detected• SDI present and 24 Bit operation and group 4 selected• SDI present and no AES detected and no group selected
Red	<ul style="list-style-type: none">• SDI input is missing• Group selected and no AES detected• Group selected and AES asynchronous and SRC bypassed

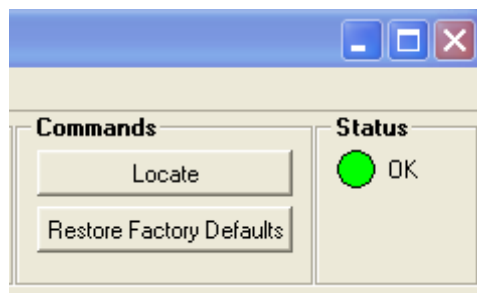
Auto Store

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.

Locate Function

For larger systems which may have multiple MiniModules 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 (P MX 5212 B)

Inputs (video)

Signal	1 x SDI 4:2:2 SMPTE 259M-CD (270 / 360 Mbps)
Connection	BNC
Impedance	75 Ohms
Return loss	> 15dB (270 MHz)
Max cable length	250 m (270 MHz)

Inputs (audio)

Signal	2 x AES 3id SMPTE 272M-ABCDEFG
Connection	BNC
Impedance	75 Ohms

Outputs

Signal	4 x SDI 4:2:2 SMPTE 259M-CD (270 / 360 Mbps) with EDH and SMTE 276M
Connection	BNC
Impedance	75 Ohms
Jitter	< 0.2 UI

Operating Modes

Embedding	Embed audio 2 x AES (one group) in one of four user selectable groups in the SDI input stream
Delete	Delete all selected audio groups.

Performance

AES input sample rate	48 KHz synchronous or 30 KHz...48KHz asynchronous
AES sample size	20 or 24 bit
Control	Local settings (dip switch) and via remote with LYNX controller
Status Monitoring	Local LED`s

Electrical Specifications

Operating Voltage	12 VDC
Power Consumption	5W
Safety	IEC 950/ EN 60950/VDE 0805

Mechanical

Size	283mm x 78mm
Weight	Card module 120g, connection panel 50g

Ambient

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

Supplied Accessories

Documentation	P MX 5212 B Reference Manual
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Available Options

Below is a list of related products for the P MX 5212 B 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 MX 5212 B CardModule (complete)

Description	Dual AES Audio Embedder
Model Number	P MX 5212 B
Part Number	6.155.009.210

Sub Assemblies:

P MX 5212 B Processing Board only. (BS 5094_B)

Part Number	6.155.009.301
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Rear Connection Panel for P MX 5212 B(MA5026_D)

Part Number	6.155.009.313
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Service

If you are experiencing problems, or have questions concerning your P MX 5212 B 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.
Phone	+ 49 (0) 6150 1817 0
Fax	+ 49 (0) 6150 1817 10
Website	www.lynx-technik.com
E-Mail	info@lynx-technik.com

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