LYNX

TECHNIK AG

Reference Manual

C AD 5135

RGB / YCr Cb to SDI Converter

Series 5000 CardModule
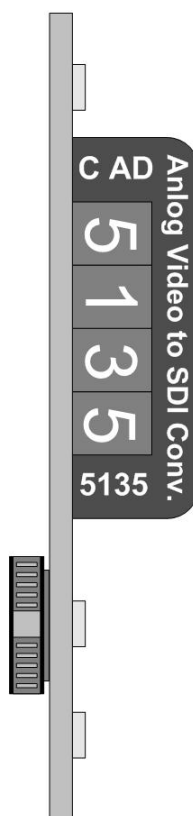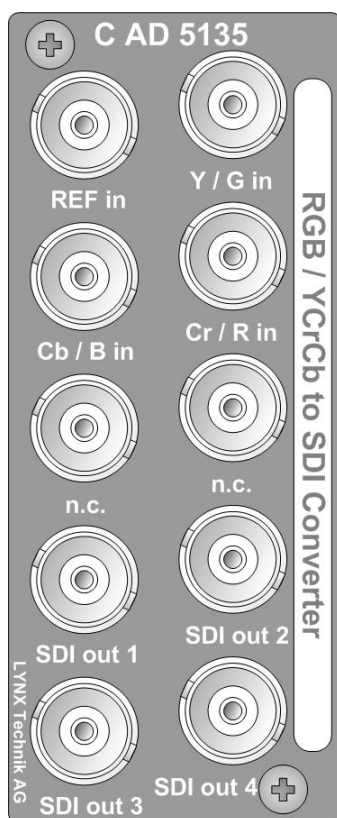
RGB / YCrCb to SDI Converter

C AD 5135

REF in

Y / G in

Cb / B in

Cr / R in

n.c.

n.c.

SDI out 1

SDI out 2

SDI out 3

SDI out 4

LYNX Technik AG

C AD 5135

Anlog Video to SDI Conv.

5135

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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.

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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: C AD 5135

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, March 2005

 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 C AD 5135 is a high performance 12 Bit Video A/D Converter for analog RGB or Y Cr Cb signals and is designed primarily for broadcast and professional applications.

The input architecture is differential to assure optimal resistance against distortion.
Input standard detection is automatic.
RGB is converted to Y Cr Cb in the digital processing stage of the module to ensure highest quality.
A Reference Signal can be selected from the Input or from an external source.
The horizontal position of the output signal can be adjusted and an adjustable output delay of up to 4 lines is provided.

The C AD 5135 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.

Functional Diagram

Figure 1 below is the basic functional diagram for the C AD 5135 CardModule.
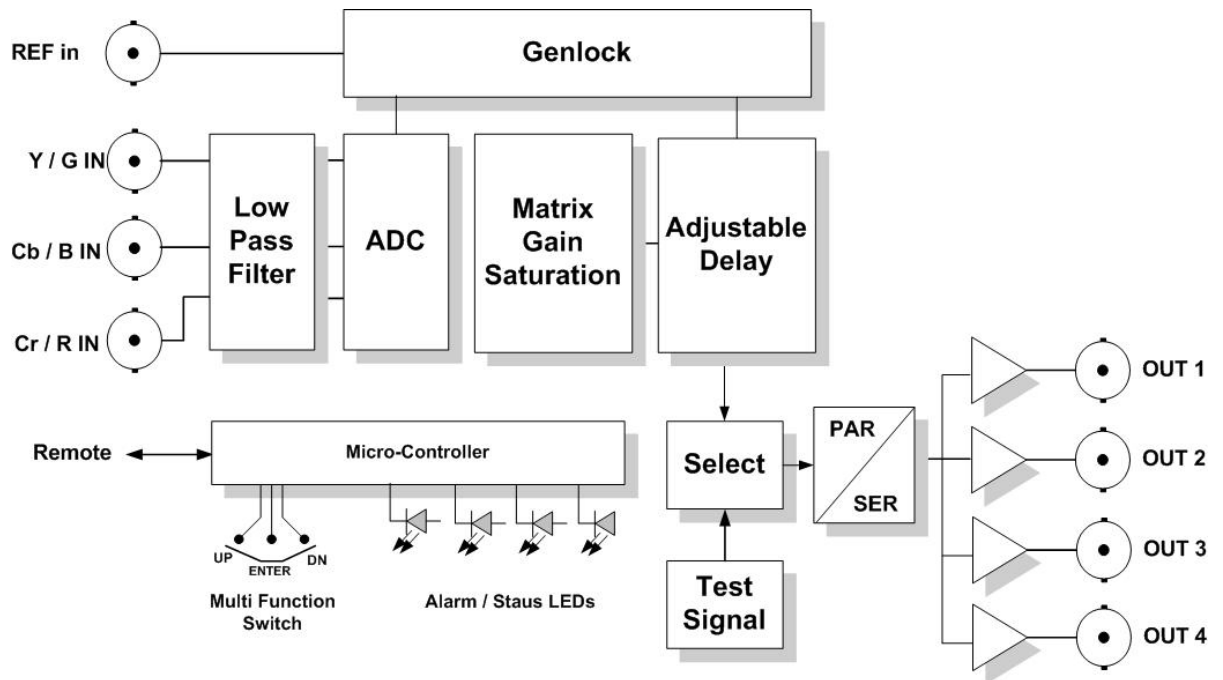
Figure 1- C AD 515 Functional Diagram

Module Layout

Figure 2 shows the physical layout of the C AD 5135 CardModule and also the connection panel which is fitted to the rear of the rack.

PCB Layout

Rear Connection Panel

RGB / YCrCb to SDI Converter

C AD 5135

Y / G in
Cr / R in
n.c.
SDI out 2
SDI out 4

REF in
Cb / B in
n.c.
SDI out 1
SDI out 3

LYNX Technik AG

PCB Front View

LED 1

C AD 5135

Anlog Video to SDI Conv.

Matrix Display

5135

UP

Press
for
ENTER

LED 3 (Alarm)

DN

LED 2
(Video Standard)
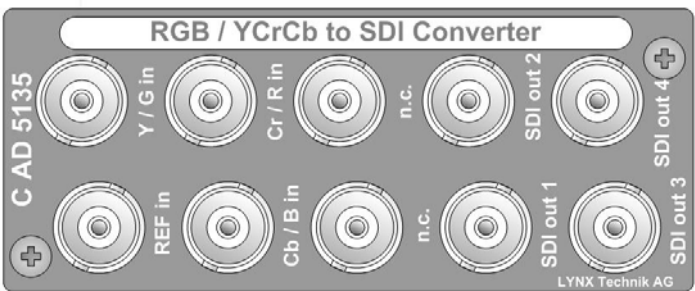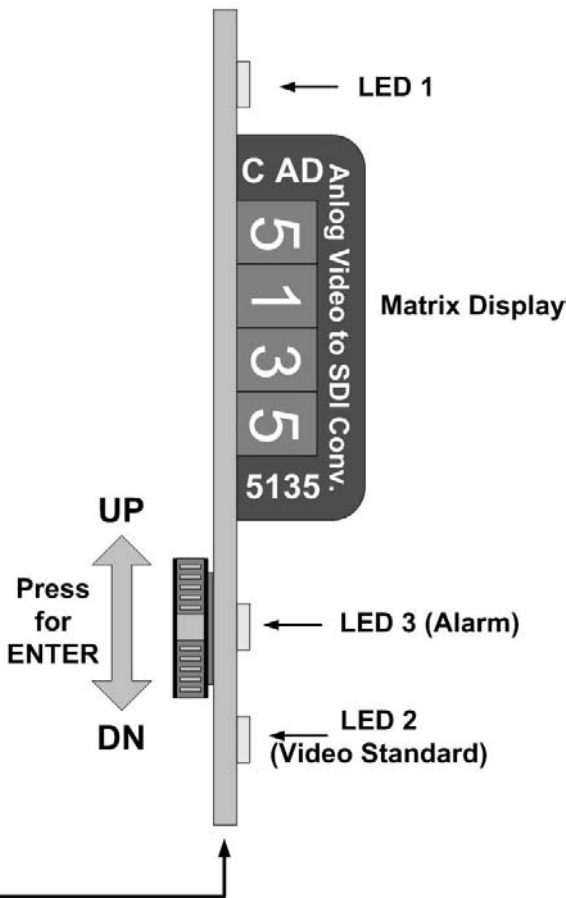
Figure 2 – Module Layout
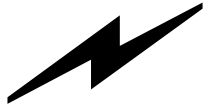
Caution

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

Connections

Video Connections

The C AD 5135 CardModule is configured with standard 75 Ohm BNC connectors. Connection is self-explanatory. We recommend the use of high quality video cable for digital 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 C AD 5135 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.
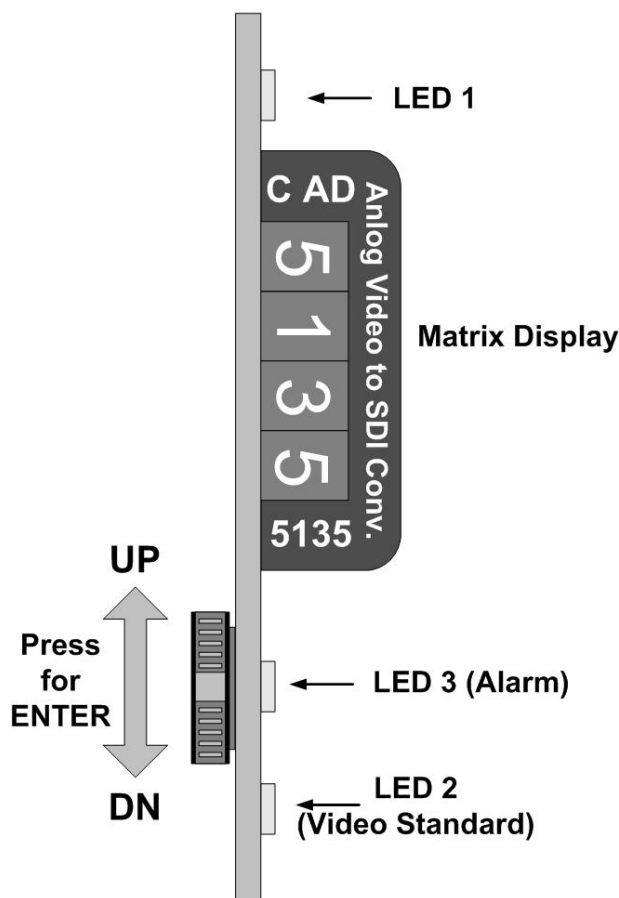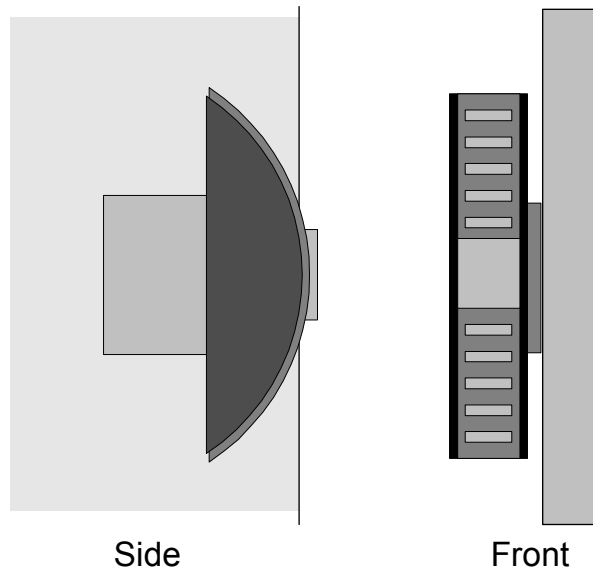
PCB Front View

Figure 3 – 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 3)

Multi-function Switch

Side   Front

Switch Operations

Up   **Down**   **Enter**
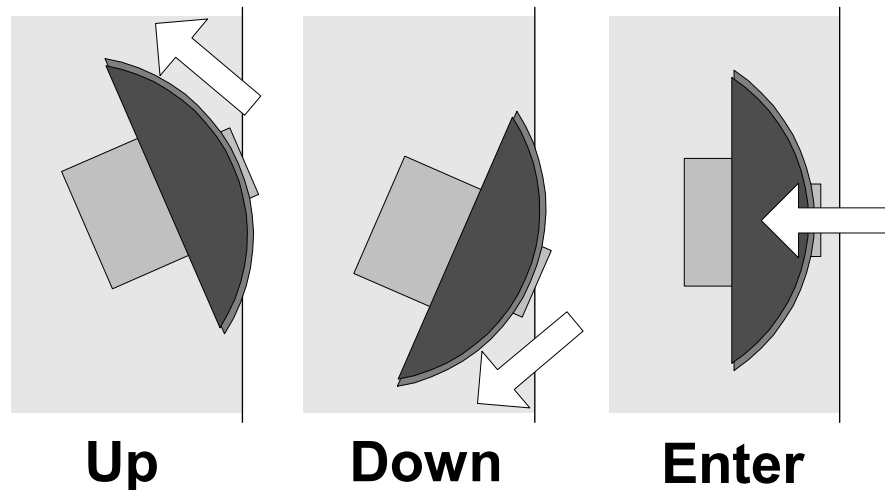
Figure 4 – Switch Operation

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

Local Adjustments Available

All of the critical adjustments to the module are accessible using the local display and multi - function switch, these include:

- Input select (Y Cr Cb / R G B)
- Sync in Video / External
- Input Gain Alignment
- Output Delay
- Horizontal Position
- VBI blank/transparent
- Saturation, Pedestal, Gain
- Test signal select

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 he 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
5135	IN				"Normal" Root display on module = Module type
		REF	VID / EXT / back		Select Reference Source: - VID: Reference from Input signal (Y/G) - EXT: External Reference
		MODE	GBR / YUV / back		Input Mode
		GAIN	G / B / R / Y / Cr / Cb / back	0000 / 0000 / 0000 / 0000 / 0000 / 0000	Set Input Gain: 0..4095
		noIN	BLK / BLUE / back		Output if no Input present: - BLK: Output Full Screen Black - BLUE: Output Full Screen Blue
		back			

Set luminance gain: 0..4095

Set saturation: 0..4095

Set pedestal: 0..4095

Set horizontal position: -128 .. +127

Set output delay:
- Pixel: 0.. 1715 (525) .. 1727 (625)
- Lines: 0..4

Vertical Blanking Interval:
- TRA: Transparent
- BLNK: Blanked

LUM	0000
SAT	0000
PED	0000
HPOS	0000
DLAY	PIXL
	LINE
	back
BLNK	TRA
	BLNK
	back
back	

OUT

TEST

SLCT

BARS
BRED
BLK
PATH
OFF
back

Select test signal
BARS = Color Bars
BRED = Color Bars with Red Field
BLK = Black
PATH = PLL/Equaliser pathological test signal

STD

525
625
back

Select video standard for test signal:

back

RSET

NO
YES

back

Restore factory defaults

Factory Preset Condition

The C DA 5135 is delivered programmed and preset for the following mode of operation:

Mode	**RGB**
Standard	**Auto**
Pedestal	**0**
Gain	**2048 (0 dB)**
Saturation	**2048**
Test Signal	**Bars**
Test Signal Standard	**Auto**

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 C AD 5135 module has integral LED indicators, which serve as alarm and status indication for the module. Function is described below.

Status Indicators

2 status LED`s are provided on the front edge of the module, LED 1, LED 2 (figure 3)

LED	Color	Indication
1	Green	Sync detected
	Yellow	Video Overlad
	Red	No Sync detected
2	Green	525 Mode
	Yellow	625 mode
	Red	No standard detected

Alarm Indicator

There is also a single alarm LED on the lower edge of the module LED 3. This is visible through the card frame front cover and provides a general indication of the module status.

LED Color	Indication
Green	Sync detected
Yellow	Test Signal Selected or Video overload
Red	No Synch detected

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:
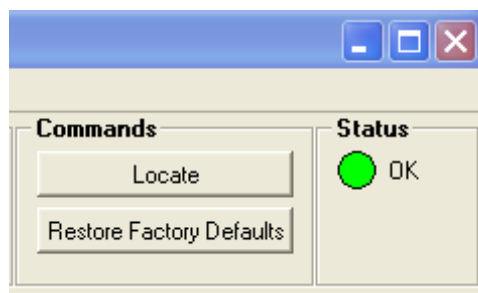
Locate Function in Control System

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 *(C AD 5135)*

Inputs (Video)

Signal	Analog RGB or Y Cr Cb
	AC coupled, differential inputs
Input Impedance	75 Ohm
Connection	BNC
Return Loss	> 35dB to 5.5 MHz

Input(Reference)

Signal	SMPTE 170M (525 line) or CCIR624 (625 line)
Input Impedance	75 Ohm
Connection	BNC
Return Loss	> 35dB to 5.5 MHz

Outputs

Signal	4 x serial 4:2:2 SMPTE 259M-C (270 Mbps)
Output Level	0.8V p-p nom.
Jitter	< 0.2UI
Connection	BNC
Output Impedance	75 Ohms

Performance

Quantization	12 Bits
Frequency Response	± 0,1 dB ...5,0 MHz, ± 0,2 dB ...5,5 MHz
Sampling	27 MHz (2 x over sampling)
Channle Matching	± 2ns
S/N Ratio	< -60 dB (unweighted to 5,75 MHz)

Electrical Specifications

Operating Voltage	+ 12 VDC
Power Consumption	6 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	C AD 5110 Reference Manual

Available Options

Below is a list of related products for the C AD 5135 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 5030	Master controllerwith TCP/IP Interface 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 5020/5030

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.

C AD 5135 CardModule (complete)

Description	RGB / YCrCb to SDI Conv.
Model Number	C AD 5135
Part Number	5.155.007.245

Sub Assemblies:

C AD 5135 Processing Board only (BS5020)

Part Number	5.155.007.250

Rear Connection Panel for C AD 5110 (MA5001)

Part Number	6.155.008.371

Service

If you are experiencing problems, or have questions concerning your C AD 5135 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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