

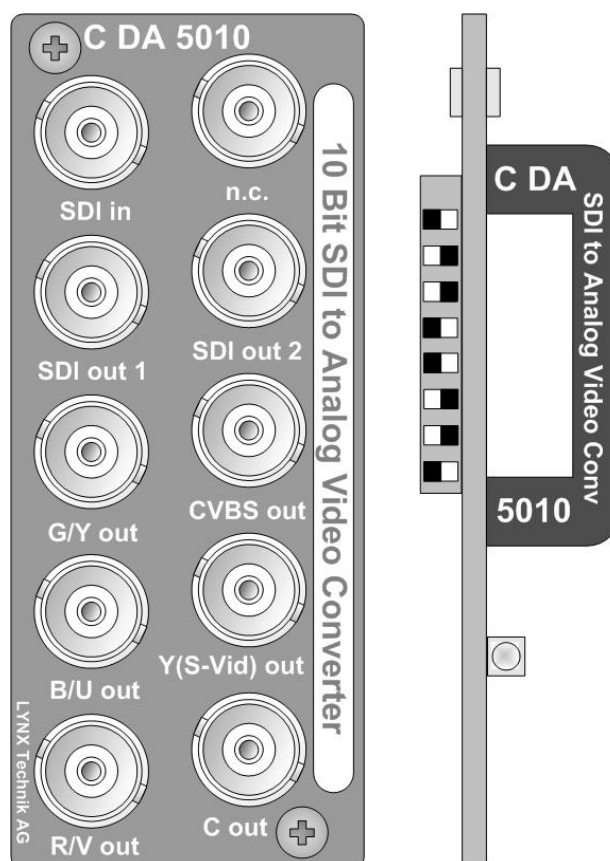
Reference Manual

Ver 1.8

C DA 5010

10 Bit SDI to Analog Video Converter

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 Brunneweg 3 D-64331 Weiterstadt Germany
<i>Declare under our sole responsibility that the product</i>	
TYPE: C DA 5010	
<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, November 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 C DA 5010 is a high quality 10 bit video D/A converter designed primarily for broadcast and professional applications.

The Module accepts 1 SDI input signal and provides a RGB or YUV component analog output. It also provides 3 x CVBS, or 1x CVBS and one S-Video (Y/C) output (in parallel to the component analog output selected). The component outputs can also be configured to provide 3 x Black Burst reference outputs if required. Two re-clocked SDI loop through signals are provided for further use downstream.

The C DA 5010 has a variety of features, which includes:

- Component RGB or YUV component video outputs plus
- 3x CVBS or CVBS and a S video output (Y/C)
- 3 x Black Burst output selectable (on component outputs)
- PAL or NTSC operation, auto detect
- Internal color bars
- If no input signal is present, test signals can be selected or output can be disabled automatically
- Internal 4x over sampling (54MHz)
- 2 x reclocked SDI loop through outputs
- Local DIP-switches 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 using the optional rack controller

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 DA 5010 CardModule.

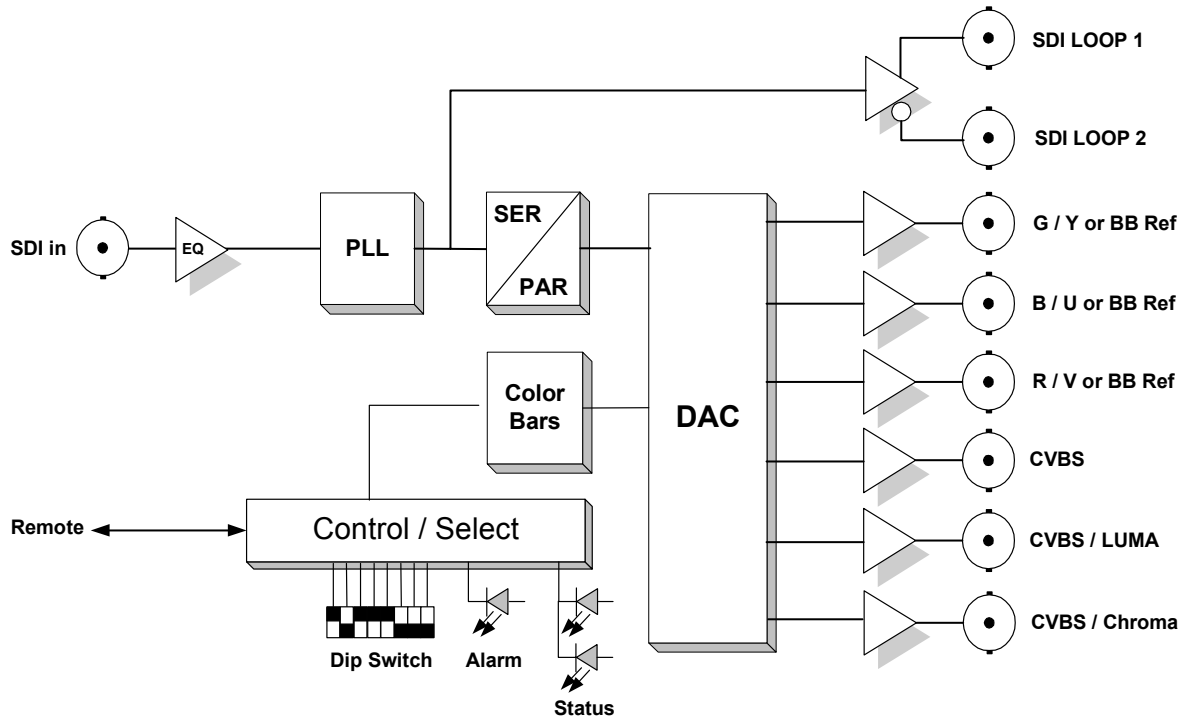
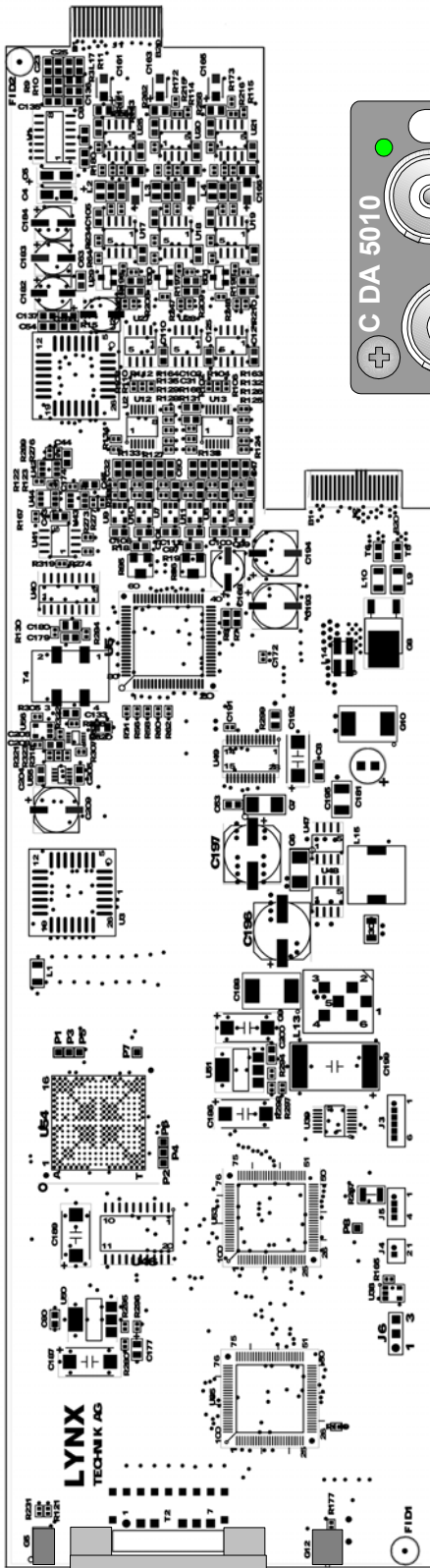


Figure 1- C DA 5010 Functional Diagram

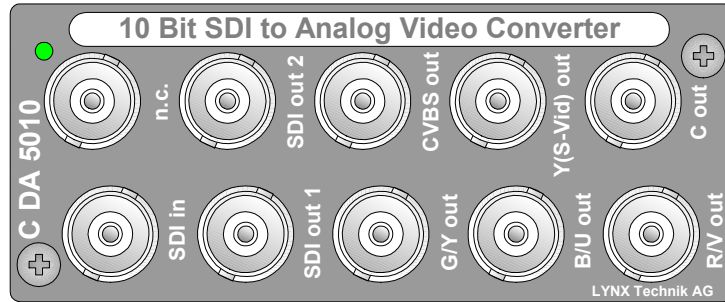
Module Layout

Figure 2 shows the physical layout of the C DA 5010 CardModule and also the connection panel which is fitted to the rear of the rack.

PCB Layout



Rear Connection Panel



PCB Front View

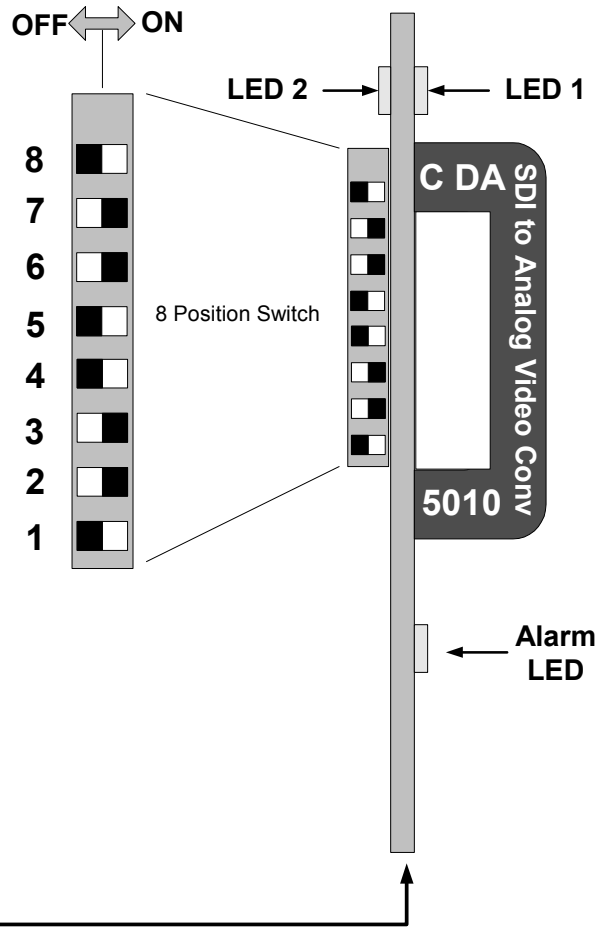


Figure 2 – Module Layout



Caution

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

Connections

Video Connections

The C DA 5010 CardModule is configured with standard 75 Ohm BNC connectors. Connection is self-explanatory. We recommend the use of high quality video cables 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 DA 5010 has an integrated micro-controller, which enables the module to be configured and controlled locally using integral 8 position dip 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.

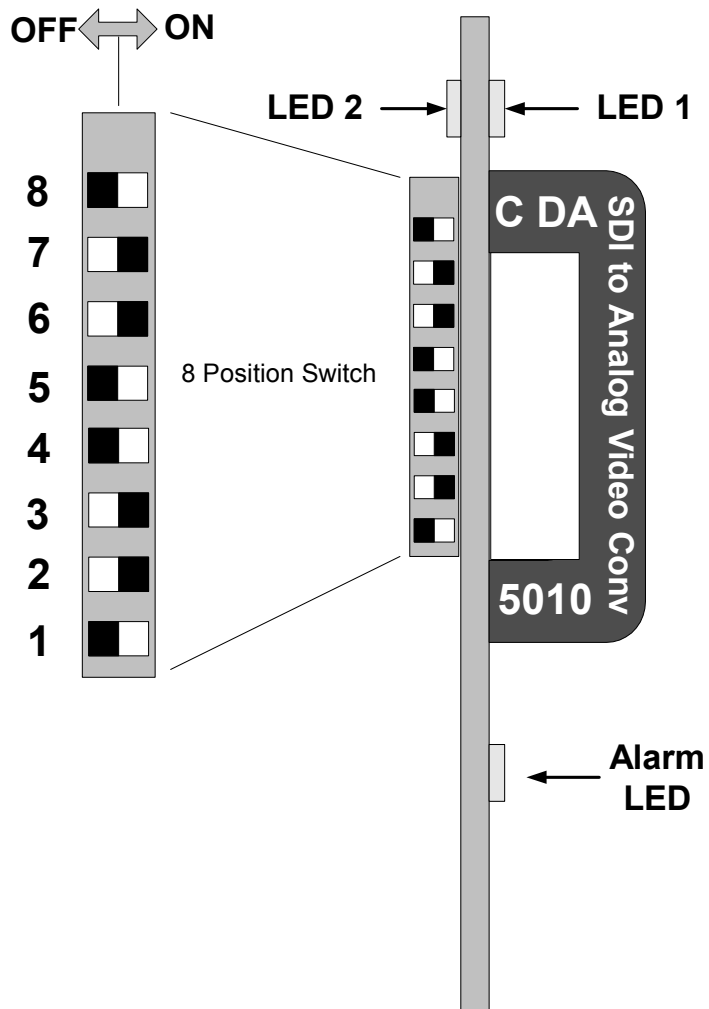


Figure 3 – Switch and LED locations

Switch Settings

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
1	ON	Enable Local Adjustments
	OFF	Disable local Adjustments
2	ON	RGB Component Output
	OFF	YUV Component Output
3	ON	3 x CVBS outputs
	OFF	1 x CVBS and S Video (Y/C) outputs
4	ON	Test signal (color bars) ON
	OFF	Test Signal (color bars) OFF
5	ON	Test Signal format = NTSC
	OFF	Test Signal Format = PAL
6	ON	Switch 7 active
	OFF	If no input, then output = Color Bars
7	ON	If no input, output disabled
	OFF	If no input, then output = Color Bars
8	ON	VBI disabled (transparent)
	OFF	VBI enabled (blanked)

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 dip-switches. **ON** enables local control and makes selections on the dipswitch active, and **OFF** disables local control (locking out any local changes)

Note.

*When Switch 1 is initially switched to **ON**, the static settings currently set on the dip-switches may not reflect the actual configuration stored in the module. This is because all settings can be*

changed from the remote control system. This overrides the local dip switches regardless of Switch 1 ON/OFF setting. To ensure the module reads the local dip switch settings it is recommended to toggle Switch 1 **ON-OFF-ON** before making any local changes to the dip switches.

Dip Switch 2

This switch selects either RGB or YUV component analog outputs from the module. **ON** = RGB, **OFF** = YUV Only active when **Note:** Outputs selected on Switch 3 are always present.

Dip Switch 3

This is used to select the second set of analog outputs from the module. **ON** will set 3 x CVBS outputs and **OFF** will select 1X CVBS and S Video (Y/C) outputs.

Dip Switch 4

This switch will select the internal color bars, and these will pear on all outputs. **ON** selects color bars **OFF** turns them off.

Dip Switch 5

This selects the video standard for the color bar signal. This does not automatically change with the input auto detection, and has to selected manually. **ON** selected NTSC, **OFF** selects PAL

Dip Switch 6

Switch 6 and Switch 7 select what output the module should provide when the input signal is removed or missing. **ON** makes Switch 7 active. **OFF** selects color bars.

Dip Switch 7

If Switch 6 is ON the output is disabled when the input signal is removed or missing. **ON** selects disabled output output. **OFF** selects black.

Dip Switch 8

This switch is used to select VBI (vertical Blanking Interval) on and off. When set to **OFF** VBI is enabled and the module will insert a vertical blanking signal on the outgoing analog video signal. **ON** will switch the module to a transparent mode, so inserted ancillary data will not be deleted.

Remote Functions.

This is a powerful module and it was not possible to map all the functionality onto the local dipswitch. Only primary functions are covered with the switch. An extended set of controls is possible when used with the optional control system. Additional functions include:

- Selectable Luma / chroma filters
- Adjustable Contrast, Color, Brightness, Sharpness, HUE and Gamma
- Luma Saturation Control
- Luma undershoot Limiter
- Chrominance ON/OFF
- Burst ON/OFF
- YUV-Level presets: Betacam or SMPTE
- Line duration: CCIR Rec.601 / ITU-R BT 470
- NTSC Pedestal (setup)

Factory Preset Condition

The C DA 5010 is delivered preset for the following mode of operation:

- Local control ENABLED
- YUV Output
- RGB sync enabled
- Test signal OFF
- Test signal format PAL
- VBI enabled (blanked)

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

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 DA 5010 module has three LED indicators, which serve as alarm and status indication for the module. (Figure 2 or 3) Function is described below.

Status Indicators

2 status LEDs are provided on the module edge

LED 1	Same as Alarm indicator
Red	Input signal missing

LED 2	Indication
Green	Local control enabled
OFF	Remote Control enabled

Alarm Indicator

There is also a general alarm LED on the lower edge of the module, which can be seen when the rack front cover is fitted.

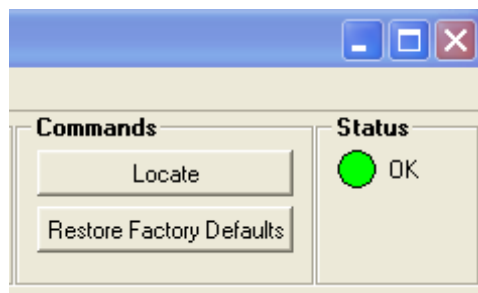
LED Color	Indication
Green	Input signal present
Yellow	Test pattern selected (color bars)
Red	Input signal missing

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

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 (C DA 5010)

Inputs

Signal	Serial 4:2:2 SMPTE 259M-C (270 Mbit/s) Standards NTSC-(M/N), PAL (B/D/G/H/I/N/60) Auto detection
Return Loss	>15dB (270MHz)
Jitter	<0,2UI
Connection	BNC
Impedance	75 Ohm

Outputs

Signal (component)	YUV or RGB component analog or 3 x Black Burst reference (selectable)
Signal (composite)	3 x CVBS or 1x CVBS and S-Video (Y/C) (selectable)
Return Loss	>35dB (5,75MHz)
Signal to noise	>62dB
Connections	BNC
Impedance	75 Ohm

Operating Modes

Conversion	D/A conversion for SDI-Signals
TV Standard	NTSC or PAL (Auto detect)
Test	Internal Color Bars

Performance

Quantization	10 Bits
Sampling	54 MHz (4x Over sampling)
Filters	Selectable Chroma and Luma filters (remote only)
S/N Ratio	< -62 dB (unweighted to 5,75 MHz)

Electrical Specifications

Operating Voltage	+ 5VDC
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 -20°C to +70°C Storage
Humidity	Max 90% non condensing

Supplied Accessories

Documentation	C DA 5010 Reference Manual
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Available Options

Below is a list of related products for the C DA 5010 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 5030	Master controller with TCP/IP interface 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.

C DA 5010 CardModule (complete)

Description	10 Bit SDI to Ana. Vid. Conv.
Model Number	C DA 5010
Part Number	6.155.008.220

Sub Assemblies:

C DA 5010 Processing Board only (BS 5010)

Part Number	6.155.006.220
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Rear Connection Panel for C DA 5010 (MA3001_B)

Part Number	6.155.001.250
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Rear Connection Foil for C DA 5010

Part Number	6.155.001.250
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Service

If you are experiencing problems, or have questions concerning your C DA 5010 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
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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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