network

Flashlink User Manual

DA-SDI-NRC

SDI Distribution Amplifier
Non-reclocking version

Rev. 3

network-electronics.com

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Revision history

Current revision of this document is the uppermost in the table below.

Rev.	Repl.	Date	Sign	Change description
3	2	2007-10-25	AS	New front page.
2	1	2007-10-05	AS	Added Materials Declaration and EFUP
1	0	2007-01-29	SHH	Updated manual to DA-SDI-mkII design with 8 outputs.
0	A	2005-04-06		First official release; no changes from Rev.A.
A	-	2004-01-20		Preliminary version

Contents

1 Product overview

The Flashlink DA-SDI-NRC is a serial digital video distribution amplifier module providing high performance media distribution for various signal formats from 1Mbps up to 540Mbps. The unit can be configured to do cable equalising of SMPTE 259M, DVB-ASI and other signal formats.

The input typically provides an automatic cable equaliser for up to 250 metres of cable (Belden 8281A at 270Mbps) with 8 outputs. Special considerations has also been taken to enable all possible DVB-ASI rates including empty transport streams with only K28.5 padding packets. Outputs 1-6 are non-inverting to support DVB-ASI compatibility. Outputs 7 and 8 are inverting.

The DA-SDI-NRC is designed for all distribution purposes in studio, duplication and Broadcast applications.

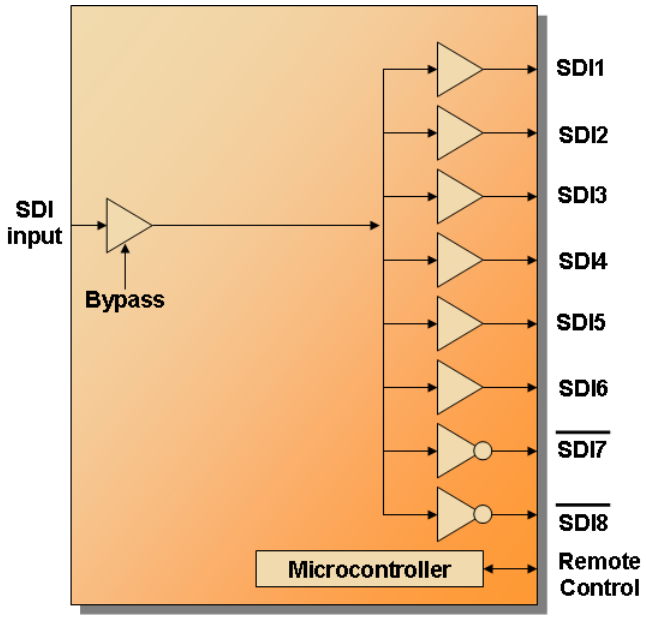


Figure 1: DA-SDI-NRC 270Mbps Serial Digital Distribution Amplifier

2 Specifications

Electrical Input

Data rate NRZ:	1 to 540 Mbps
Data rate RZ:	1 to 270 Mbps
Equalisation:	Automatic Cable equaliser can be bypassed to support bitrates down to 1Mbps.
Impedance:	75 ohm
Return loss:	>15dB (500kHz – 270MHz)
Signal level:	nom. 800mV approx. 200mV min. when equaliser switched to Bypass
Connector:	BNC

Electrical Output

Number of outputs:	8 (6)
Connector:	BNC
Impedance:	75 ohm
Return loss:	>15dB (500kHz – 270MHz)
Jitter:	max 0.2UI
Peak to peak signal level:	0.8V ± 80mV
Signal polarity	6 non inverting, 2 inverting

Features

Input equaliser:	EQ bypass for low bit rates

Electrical

Power:	+5V DC / 3W Max.
Control:	Control system for access to setup and module status with BITE (Built-In Test Equipment) for use with GYDA Control System.

Supported standards

SMPTE:	SMPTE 259M
AES:	AES-3id (with EQ switched off)

3 Format configuration

The DA-SDI-NRC can support a number of different formats. The correct configuration can either be set with a DIP switch or with the GYDA Control System. The layout of DA-SDI-NRC is shown in the drawing below with the DIP switch to the upper left position.

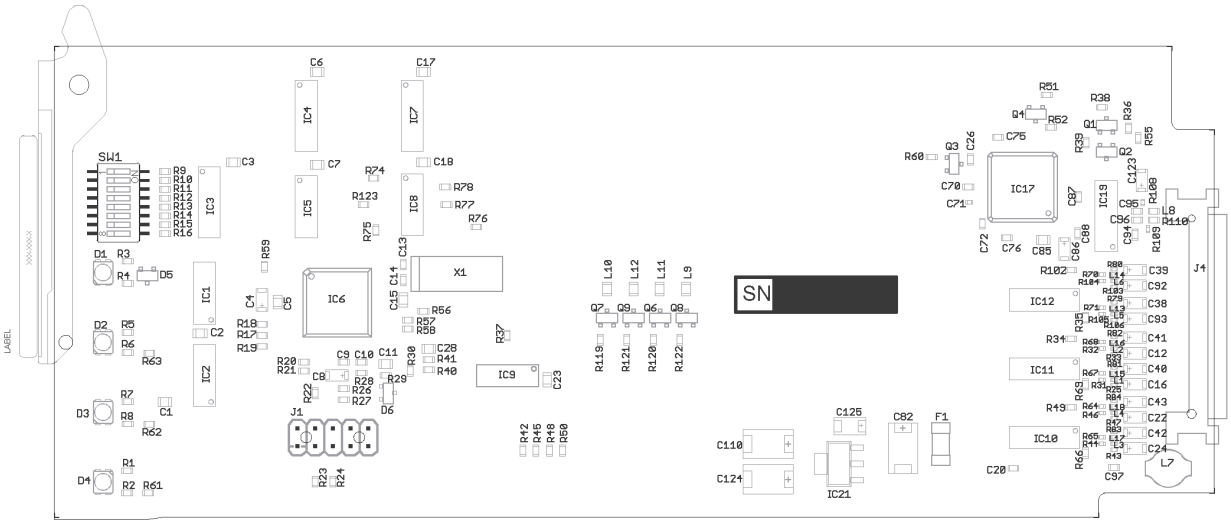


Figure 2: DA-SDI-NRC board layout.

DIP switch configuration must be set according to the table below:

Switch #	Label	Function DIP=OFF	Function DIP=ON	Comment
1	ARB	NA	NA	NA
2	EQM	Equaliser forced not to mute	Automatic muting of equaliser when signal strength is too low	Input mute
3	RCL	NA	NA	NA
4	EQ	Cable equaliser Bypass	Cable equaliser ON	Equaliser mode
5	ASI	NA	NA	NA
6	SLL	NA	NA	NA
7	BWL	NA	NA	NA
8	OVR	GYDA control Config. with GYDA	Override GYDA control Config. with DIP switch	Select GYDA config. mode

All DIP switches are off when pointing towards the release handle.

3.1 Configuration Examples

Typical configurations for DA-SDI-NRC:

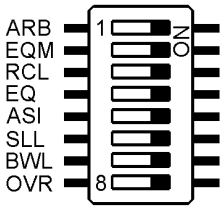


Figure 3: Default; All SMPTE / DVB-ASI rates with automatic cable equalising.

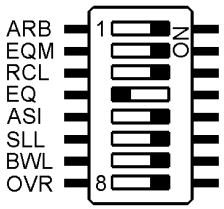


Figure 4: AES3id compatible and Low Bit rate without equalisation.

4 Connector module

The DA-SDI-NRC has two dedicated connector module: DA-SDI-C1 and DA-SDI-C2. These modules are mounted at the rear of the sub-rack. The modules are shown in Figure 5 and Figure 6.

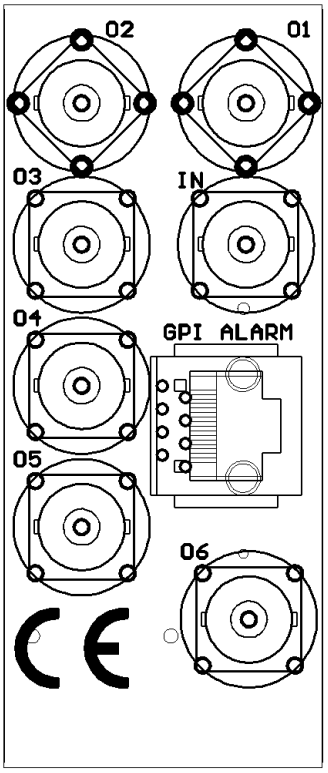


Figure 5: Overview of the DA-SDI-C1 connector module.

The electrical input signal is connected to the IN BNC and the electrical outputs are connected to the O1 to O6 BNC's. Please note that all 6 outputs are non-inverted.

On DA-SDI-C2 the electrical input signal is connected to the IN BNC and the electrical outputs are connected to the O1 to O8 BNC's. Please note that outputs 1 to 6 are non-inverted and suitable for DVB-ASI, while outputs 7 and 8 are inverting and cannot be used for DVB-ASI.

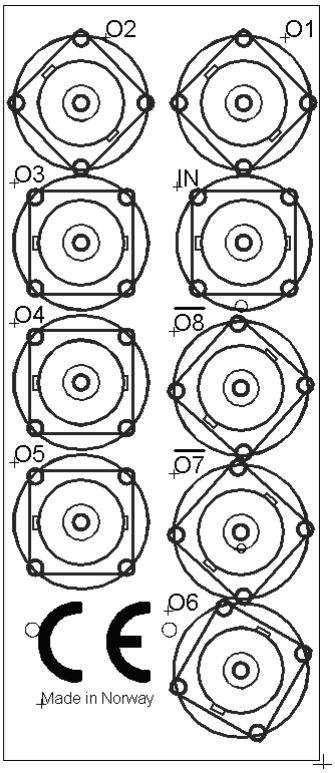


Figure 6: Overview of the DA-SDI-C2 connector module.

Unused outputs should be terminated with 75 ohm.

DA-SDI-C2 does not have any GPI alarm outputs.

4.1 Mounting the connector module

The details of how the connector module is mounted, is found in the user manual for the sub-rack frame FR-2RU-10-2.

This manual is also available from our web site: http://www.network-electronics.com/.

5 Module status

The status of the module can be monitored in three ways.

1. GYDA System Controller (optional).
2. GPI at the rear of the sub-rack.
3. LED's at the front of the sub-rack.

Of these three, the GPI and the LED's are mounted on the module itself, whereas the GYDA System Controller is a separate module giving detailed information on the card status. The functions of the GPI and the LED's are described in sections 5.1 and 5.2. The GYDA controller is described in a separate user manual.

5.1 GPI ALARM – Module Status Outputs

These outputs can be used for wiring up alarms for third party control systems. The GPI outputs are open collector outputs, sinking to ground when an alarm is triggered. The GPI connector is shown in Figure 7.

Electrical Maximums for GPI outputs

Max current: 100mA

Max voltage: 30V

DA-SDI-NRC module GPI pinning:

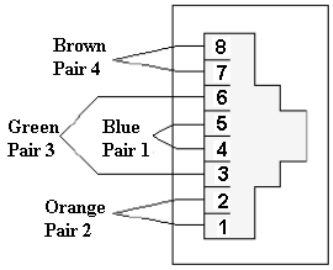
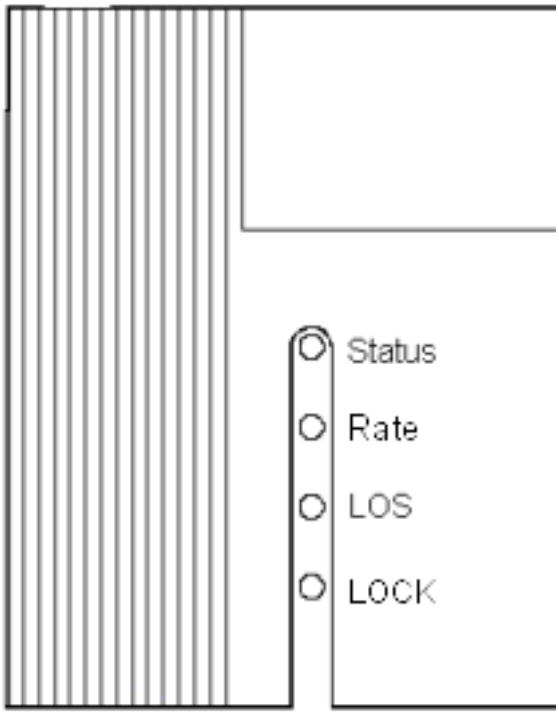


Figure 7: GPI Outlet

Signal	Name	Pin #	Mode
Status	General error status for the module.	Pin 1	Open Collector
Rate	NA	Pin 2	Open Collector
LOS	Los Of Signal	Pin 3	Open Collector
LOCK	NA	Pin 4	Open Collector
Ground	0 volt pin	Pin 8	0V

5.2 Front Panel - Status Monitoring

The status of the module can be easily monitored visually by the LED's at the front of the module. The LED's are visible through the front panel as shown in Figure 8 below.



(Text not printed on the front panel).

Figure 8: Front panel indicator overview for DA-SDI-NRC

The DA-SDI-NRC has 4 LED's each showing a status corresponding to the GPI pinning. The position of the different LED's is shown in Figure 8.

Diode\state	Red LED	Yellow LED	Green LED	No light
Status	Module is faulty		Module is OK Module power is OK	Module has no power
Rate	NA	NA	NA	Always
LOS	Loss of signal No input signal.	LOS detection de-activated (EQM=off)	Input signal present	
LOCK	NA	NA	NA	Always

General environmental requirements for Network Electronics equipment

1. The equipment will meet the guaranteed performance specification under the following environmental conditions:
   - Operating room temperature range: 0°C to 40°C
   - Operating relative humidity range: <90% (non-condensing)

2. The equipment will operate without damage under the following environmental conditions:
   - Temperature range: -10°C to 50°C
   - Relative humidity range: <95% (non-condensing)

3. Electromagnetic compatibility conditions:
   - Emissions: EN 55103-1 (Directive 89/336/EEC)
   - Immunity: EN 55103-2 (Directive 89/336/EEC)

Certificate of Conformity

Network Electronics ASA N-3204 Sandefjord Norway	Company Registration Number: NO 976 584 201 MVA

Declares under sole responsibility that the product:

Product name:	DA-SDI-NRC
Product description:	SDI Distribution Amplifier – Non-Reclocking version

To which this declaration relates are of Norwegian origin and are in conformity with the following standards:

EN 55103-1: 1996	Generic Emissions Standard
EN 55103-2: 1996	Generic Immunity Standard

Product Warranty

The warranty terms and conditions for the product(s) covered by this manual follow the General Sales Conditions by Network Electronics ASA. These conditions are available on the company web site of Network Electronics ASA:

www.network-electronics.com

Appendix A Materials declaration and recycling information

A.1 Materials declaration

For product sold into China after 1st March 2007, we comply with the "Administrative Measure on the Control of Pollution by Electronic Information Products". In the first stage of this legislation, content of six hazardous materials has to be declared. The table below shows the required information.

組成名稱 Part Name	Toxic or hazardous substances and elements					
	鉛 Lead (Pb)	汞 Mercury (Hg)	镉 Cadmium (Cd)	六价铬 Hexavalent Chromium (Cr(VI))	多溴联苯 Polybrominated biphenyls (PBB)	多溴二苯醚 Polybrominated diphenyl ethers (PBDE)
DA-SDI-NRC	X	O	O	O	O	O

O: Indicates that this toxic or hazardous substance contained in all of the homogeneous materials for this part is below the limit requirement in SJ/T11363-2006.

X: Indicates that this toxic or hazardous substance contained in at least one of the homogeneous materials used for this part is above the limit requirement in SJ/T11363-2006.

A.2 Environmentally-friendly use period

The manual must include a statement of the "environmentally friendly use period". This is defined as the period of normal use before any hazardous material is released to the environment. The guidance on how the EFUP is to be calculated is not finalised at the time of writing. See http://www.aeanet.org/GovernmentAffairs/qfLeOpAaZXaMxqGjSFbEidSdPNtpT.pdf for an unofficial translation of the draft guidance. For our own products, Network Electronics has chosen to use the *50 year figure* recommended in this draft regulation.

Network Electronics suggests the following statement on An "Environmentally Friendly Use Period" (EFUP) setting out normal use:

> **EFUP is the time the product can be used in normal service life without leaking the hazardous materials. We expect the normal use environment to be in an equipment room at controlled temperature range (0°C - 40°C) with moderate humidity (< 90%, non-condensing) and clean air, not subject to vibration or shock.**

Further, a statement on any hazardous material content, for instance, for a product that uses some tin/lead solders:

> **Where a product contains potentially hazardous materials, this is indicated on the product by the appropriate symbol containing the EFUP. The hazardous material content is limited to lead (Pb) in some solders. This is extremely stable in normal use and the EFUP is taken as 50 years, by comparison with the EFUP given for Digital Exchange/Switching Platform in equipment in Appendix A of "General Rule of Environment-Friendly Use Period of Electronic Information Products". This is indicated by the product marking:**

> **It is assumed that while the product is in normal use, any batteries associated with real-time clocks or battery-backed RAM will be replaced at the regular intervals.**

The EFUP relates only to the environmental impact of the product in normal use, it does not imply that the product will continue to be supported for 50 years.

A.3 Recycling information

Network Electronics provides assistance to customers and recyclers through our web site http://www.network-electronics.com. Please contact Network Electronics' Customer Support for assistance with recycling if this site does not show the information you require.

Where it is not possible to return the product to Network Electronics or its agents for recycling, the following general information may be of assistance:

- Before attempting disassembly, ensure the product is completely disconnected from power and signal connections.
- All major parts are marked or labelled to show their material content.
- Depending on the date of manufacture, this product may contain lead in solder.
- Some circuit boards may contain battery-backed memory devices.