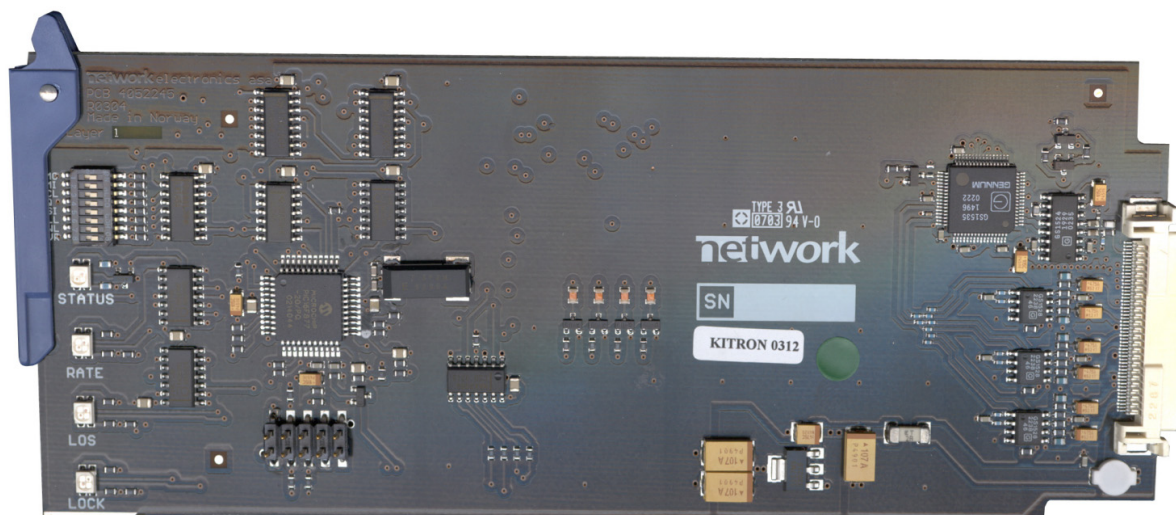




USER MANUAL

DA-HDSDI

Multi Rate HD-SDI Distribution Amplifier

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Revision history

The latest version is always available in pdf-format on our web-site:

<http://www.network-electronics.com/>

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

Revision	Replaces	Date	Change Description
4	3	2007-10-05	Added Materials Declaration and EFUP
3	2	11.10.05	Specification update
2	1	14.06.04	Update of chapter 4.
1	0	25.04.03	Corrected printing errors
0	B	23.04.03	First release
B	A	07.04.03	Preliminary version 2
A		19.02.03	Preliminary version

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1. General

The **flashlink**® DA-HDSDI is a multi bit-rate distribution amplifier module providing high performance media distribution for various signal formats from 19.4Mbps up to 1485Mbps. The unit can be configured to do cable equalising and reclocking of SMPTE 292M and SMPTE 259M signal formats.

The input typically provides an automatic cable equaliser for up to 100 metres of cable (Belden 1694A at 1485Mbps) with 6 re-clocked outputs. The DA-HDSDI will detect HD and SD rates and automatically switch to correct output slew-rate. The re-clocker supports the bit-rates; 143, 177, 270, 360, 540 and 1485Mbps. For other rates, the re-clocker automatically switches to bypass mode, and the DA-HDSDI will work as a non-reclocking distribution amplifier with cable equaliser. The DA-HDSDI also has a special DVB-ASI mode, enabling all possible rates including empty transport streams with only K28.5 padding packets. 3 of the outputs are non-inverting and suitable for DVB-ASI.

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

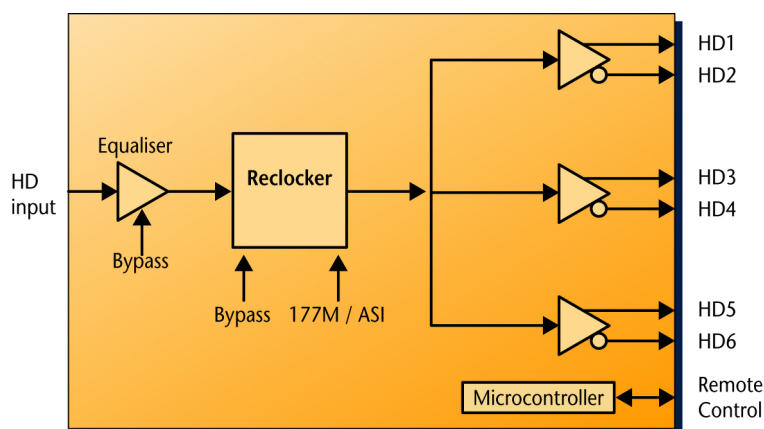


Figure 1 – DA-HDSDI Multi Bit-Rate Distribution Amplifier

2. Specifications

Electrical Input

Data rate NRZ:	19.4 to 1485 Mbps
Equalisation:	Automatic Cable equaliser and reclocker can be bypassed to support bitrates down to 1Mbps.
Impedance:	75 ohm
Return loss:	>15dB @ 1485MHz
Signal level:	nom. 800mV Apx. 200mV min. when equaliser switched to Bypass
Connector:	BNC

Electrical Output

Number of outputs:	6
Connector:	BNC
Impedance:	75 ohm
Return loss:	>15dB, acc. to ITU-R BT.1120-3
Jitter:	max 0.2UI
Peak to peak signal level:	0.8V ± 0.1V
Signal polarity	3 non inverting, 3 inverting

Features

Re-clocking:	Automatic SD / HD detection Automatic output slew rate adjustment according to SMPTE-259M / SMPTE 292M Selectable loop bandwidth Low: HD = 1.5MHz, SD = 500kHz High: HD = 3MHz, SD = 1MHz
Supported clock rates:	143, 177, 270, 360, 540 and 1485Mbps
Input equalizer:	Eq. bypass for non-video formats or 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:	SMPTE292M, SMPTE259M, SMPTE297M, SMPTE305M, SMPTE310M
DVB-ASI:	EN50083-9
AES:	AES-3id (with EQ and RCL switched off)

3. Format Configuration

The DA-HDSDI supports 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-HDSDI is shown in the drawing below with the DIP switch to the upper left position.

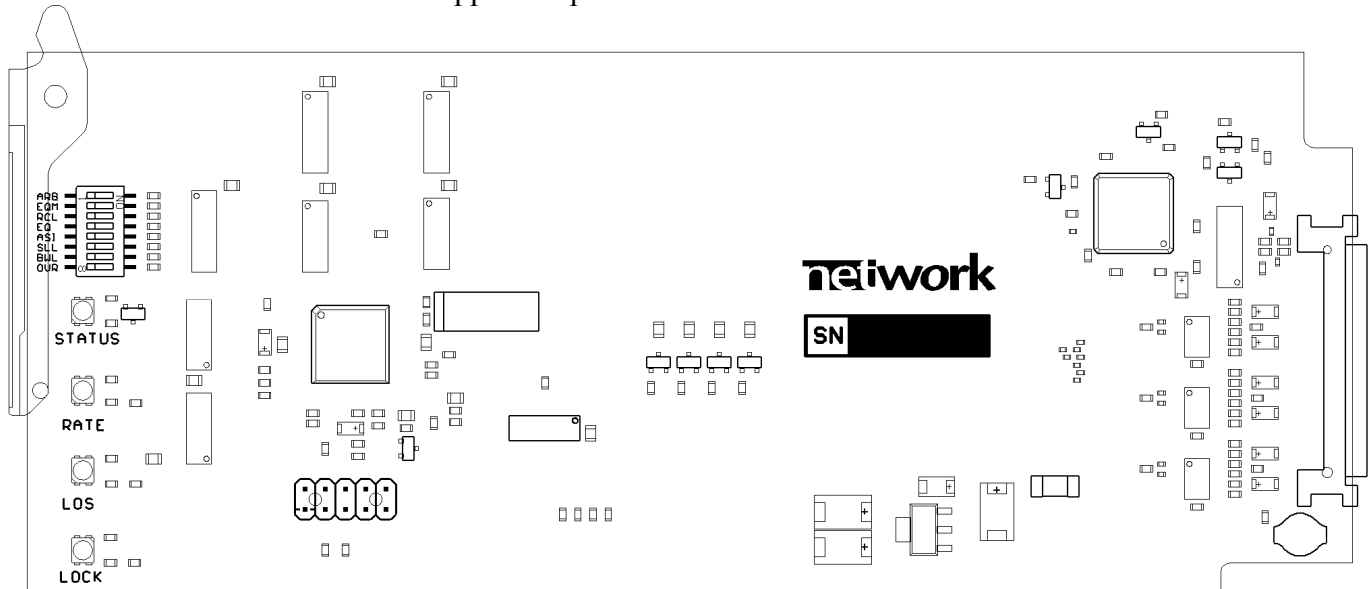


Figure 2 – DA-HDSDI board layout.

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

Switch #	Label	Function DIP=OFF	Function DIP=ON	Comment
1	ARB	Output muted when reclocker not in lock	Automatic Reclocker Bypass. Output never muted	Output mute
2	EQM	Equaliser forced not to mute	Automatic muting of equaliser when signal strength is to low	Input mute
3	RCL	Reclocker Bypass	Reclocker ON	Reclocker mode
4	EQ	Cable equaliser Bypass	Cable equaliser ON	Equaliser mode
5	ASI	SDI 177Mbps Reclocker support	DVB-ASI Reclocker support	ASI mode
6	SLL	Slew-rate override. Always high rate selected	Slew-rate limitation automatically adjusted. SMPTE 292M and 259M	Slew-rate select
7	BWL	Reclocker loop-bandwidth high	Reclocker loop-bandwidth low	Loop bandwidth select
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.

When the default setting is selected, all clock rates for HD-SDI, SDI and DVB-ASI are automatically configured by the module itself.

3.1 Configuration Examples

Typical configurations for DA-HDSDI:

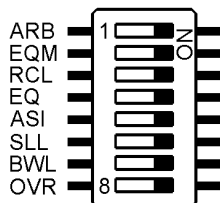


Figure 3 – Default; HD-SDI, SDI and DVB-ASI

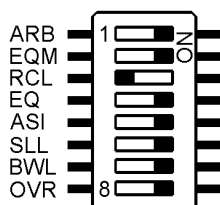


Figure 4 – Transparent Mode with equalisation and no reclocking

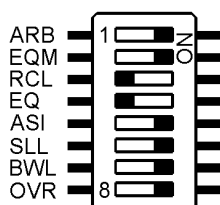


Figure 5 – AES3id compatible and Transparent Mode without equalisation and reclocking

4. Connector module

The DA-HDSDI has a dedicated connector module: DA-SDI-C1. This module is mounted at the rear of the sub-rack. The module is shown in figure 6.

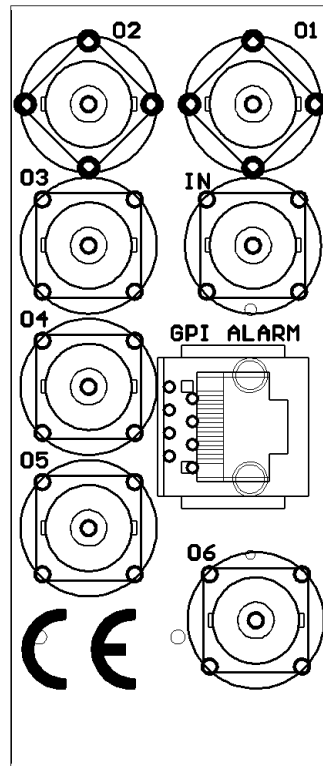


Figure 6 - Overview of the DA-SDI-C1 connector module

The electrical input signal is connected to the IN BNC and the electrical outputs are connected to the O1 to O6 BNC. Please note that O2, O4 and O6 has an inverted signal, so formats like DVB-ASI can not use be used on these outputs.

Unused outputs should be terminated with 75 ohm.

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-HDSOI module GPI pinning:

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

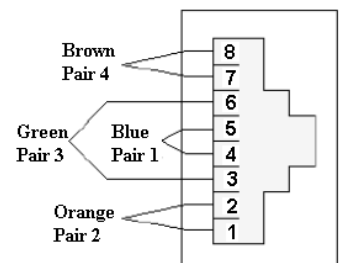
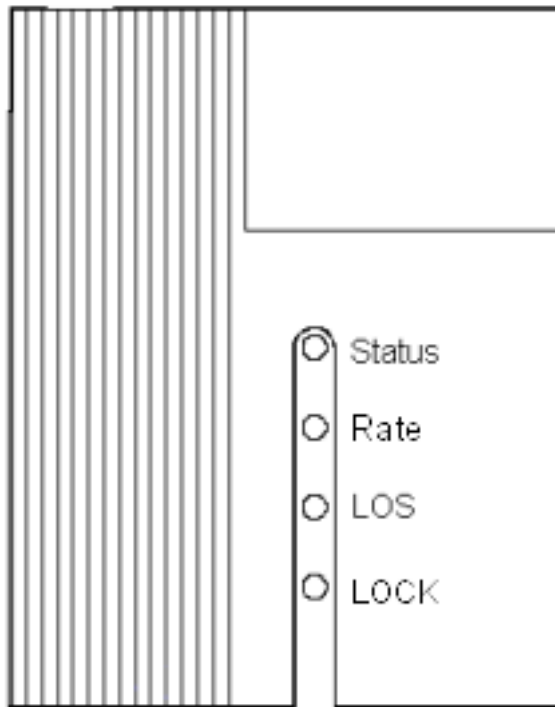


Figure 7 - GPI Outlet

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-HDSOI

The DA-HDSOI 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	Rate not detected	SD rate found	HD rate found	
LOS	Loss of signal No input signal.	LOS detection de-activated (EQM=off)	Input signal present	
LOCK	Re-clocker is out of lock	Re-clocker switched off	Re-clocker is in lock on a supported signal format	

Declaration of conformity with CE

This apparatus meets the requirements of EN 55103-1 (November 1996) with regard to emissions, and EN 55103-2 (November 1996) with regard to immunity; it thereby complies with the Electromagnetic Compatibility Directive 89/336/EEC.

General environmental requirements for Network flashlink[®] 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 up to 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 up to 95% (non-condensing)

3. Electromagnetic compatibility conditions:

- Emissions EN 55103-1 (Directive 89/336/EEC)
- Immunity EN 55103-2 (Directive 89/336/EEC)

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

Materials declaration and recycling information

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)	鎘 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-HDSOI	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.						

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.

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.