



DA-3GHD-8-PL / DA-3GHD-8

1x8 non-inverting 3GHD-SDI and ASI Distribution Amplifier
with or without passive loop-through

User manual

Rev. D

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Revision history

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

Rev.	Repl.	Date	Sign	Change description
D	3	2015-05-12	MB	Cover page update; DoC removed; no other changes to content
3	2	2012-06-18	SHH	- Updated chapter 4 that slot 1 cannot be used for 3G-SDI.
2	1	2012-04-23	RB	- Updated table 2 with corrections of LED functions. - Specifies in chapter 4 that slot 1 cannot be used with current product revision.
1	0	2012-01-09	RB	- Added the product DA-3GHD-8 to the document. - Updated table for cable equalization.
0	-	2011-10-10	RB	Release revision (not published)

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1 Product overview

The Flashlink DA-3GHD-8-PL and DA-3GHD-8 is a multi bit-rate distribution amplifier module providing high performance media distribution for various signal formats from 19.4Mbps up to 2970Mbps. The unit can be configured to do cable equalizing and reclocking of SMPTE 424M, SMPTE 292 and SMPTE 259M signal formats.

Both modules provide 8 reclocked non-inverting outputs, and the DA-3GHD-8-PL also provides a passive loop-through output. The passive loop-through output facilitates distribution of the source signal to multiple cards without corruption due to powerdown or removal of cards. The passive loop-through output must be terminated into 75 ohm, either by connecting it to a subsequent DA-3GHD-8-PL, or by attaching a 75 ohm BNC terminator.

Both modules will detect HD and SD rates and automatically switch to correct output slew-rate. The reclocker supports the bit-rates 270Mbps, 1483.5Mbps, 1485Mbps, 2967Mbps and 2970Mbps. For other rates the reclocker can automatically switch to bypass mode and the DA-3GHD-8-PL/DA-3GHD-8 will work as a non-reclocking distribution amplifier with cable equalizer. The DA-3GHD-8-PL/DA-3GHD-8 also supports reclocking of DVB-ASI at 270Mbps, enabling all possible rates including empty transport streams with only K28.5 padding packets. All 8 outputs (and the passive loop-through output) are non-inverting and suitable for DVB-ASI.

The DA-3GHD-8-PL/DA-3GHD-8 is designed for all distribution purposes in studio, duplication and Broadcast applications.

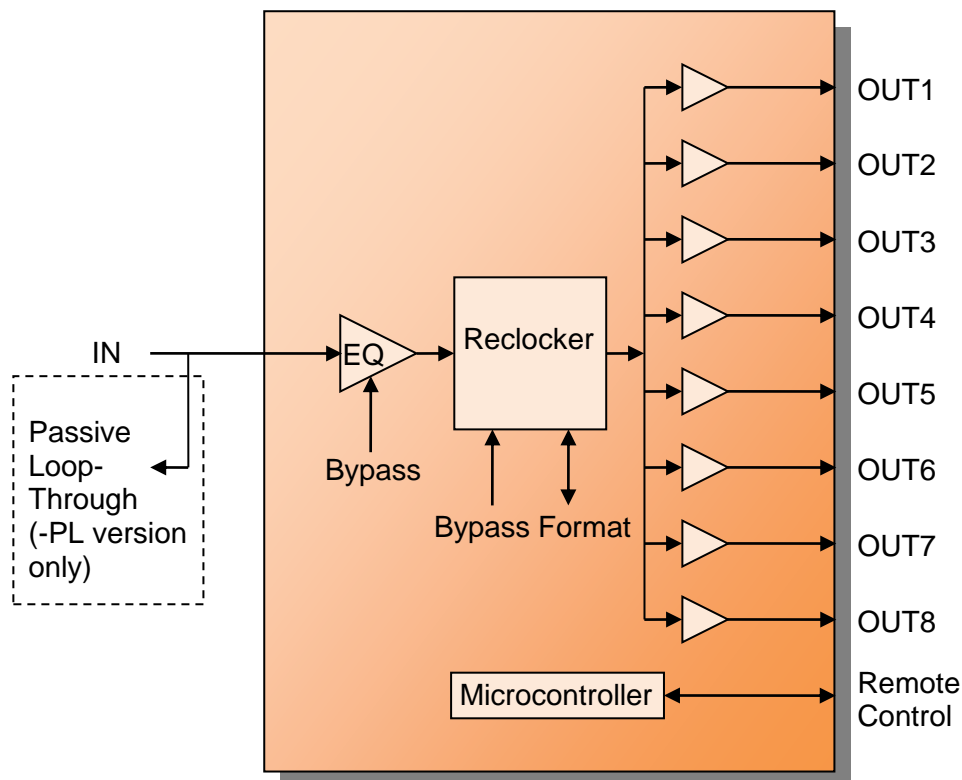


Figure 1: DA-3GHD-8-PL / DA-3GHD-8

2 Specifications

2.1 Electrical Outputs

Number of outputs	8 reclocked 1 passive loop-through (-PL version)
Connectors	75 Ohm BNC
Output Return loss	- < -15dB, 5MHz -1.5GHz - < -10dB, 1.5GHz - 3GHz
Output signal level	800mV +/- 10%
Output signal rise / fall time 20% - 80%	- SD limit: [0.4ns – 1.5ns]; <0.5ns rise/fall var. - HD limit: < 270ps, <100ps rise/fall var. - 3G HD limit: <135ps, <50ps rise/fall var.
Amplitude overshoot	<10%
Polarity	- All outputs are non-inverting
Output timing jitter	- SD: <0.2 UI - HD: <1 UI - 3G HD: <1UI
Output alignment jitter	- SD: <0.15 UI - HD: <0.15 UI - 3G HD: <0.2UI

2.2 Electrical Inputs

Number of inputs	1
Connectors	75 Ohm BNC
Input Return loss	- < -15dB, 5MHz -1.5GHz - < -10dB, 1.5GHz - 3GHz
Jitter tolerance	- SD limit: - 10Hz-10kHz: >1 UI - 10kHz-10MHz: >0.2 UI - HD limit: - 10Hz-100kHz: >1 UI - 100kHz-150MHz: >0.2 UI - 3G HD limit: - 10Hz-100kHz: >2 UI - 100kHz-300MHz: >0.3 UI

Cable equalization, DA-3GHD-8.			
Format	Min.	Typical	Comments
SD-SDI	300m		Belden 8281 BER< 10E-12 Total length of cable included patching between modules
		325m	
HD-SDI	150m		Belden 1694A BER< 10E-12 Total length of cable included patching between modules
		200m	
3GHD-SDI	70m		Total length of cable included patching between modules
		100m	

Cable equalization, DA-3GHD-8-PL, single unit.			
Format	Min.	Typical	Comments
SD-SDI	200m ^{1,2}		Belden 8281 BER< 10E-12 Total length of cable included patching between modules
		225m ^{2,3}	
HD-SDI	50m ^{1,2}		Belden 1694A BER< 10E-12 Total length of cable included patching between modules
		75m ^{2,3}	
3GHD-SDI	30m ^{1,2}		Total length of cable included patching between modules
		40m ^{2,3}	

Cable equalization, DA-3GHD-8-PL, two looped units.			
Format	Min.	Typical	Comments
SD-SDI	200m ^{1,2}		Belden 8281 BER< 10E-12 Total length of cable included patching between modules
		225m ^{2,3}	
HD-SDI	50m ^{1,2}		Belden 1694A BER< 10E-12 Total length of cable included patching between modules
		60m ^{2,3}	
3GHD-SDI	25m ^{1,2}		Total length of cable included patching between modules
		25m ^{2,3}	

Cable equalization, DA-3GHD-8-PL, three looped units.			
Format	Min.	Typical	Comments
SD-SDI	175m ^{1,2}		Belden 8281 BER< 10E-12 Total length of cable included patching between modules
		200m ^{2,3}	
HD-SDI	30m ^{1,2}		Belden 1694A BER< 10E-12 Total length of cable included patching between modules
		50m ^{2,3}	
3GHD-SDI	15m ^{1,2}		Total length of cable included patching between modules
		20m ^{2,3}	

¹ Measured with the following parameters at the limits of the standards simultaneously;

Amplitude (+/- 10%), Ambient temperature (0°C/45°C), Generator jitter:

- SD-SDI: 10Hz-10kHz: >1 UI 10kHz – 10MHz: >0.2 UI
- HD-SDI: 10Hz-100kHz: >1 UI 100kHz-150MHz: >0.2 UI
- 3GHD-SDI: 10Hz-100kHz: >2 UI 100kHz-300MHz: >0.3 UI

² Specified termination at the loop end required. 75 ohm terminations mounted at all unused output ports for HD-SDI and 3GHD-SDI required.

³ Well within limits of standards

2.3 Features

Re-clocking:	Automatic SD/ HD detection Automatic output slew rate adjustment according to SMPTE-259M and SMPTE-292M/ SMPTE424M
Supported clock rates:	270, 1483.5, 1485, 2967, 2970Mbps
Input equalizer:	Eq. bypass for non-video formats or low bit rates

2.4 Supported standards

SMPTE:	SMPTE424M, SMPTE292M, SMPTE259M, SMPTE305M, SMPTE310M
DVB-ASI:	EN50083-9

2.5 General

DC power consumption:	+5V / 1.4W
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3 Configuration

The DA-3GHD-8-PL/DA-3GHD-8 supports a number of different formats. The correct configuration can either be set with a DIP switch or with GYDA Control System. The layout of DA-3GHD-8-PL/DA-3GHD-8 is shown in the drawing below with the DIP switch to the upper left position.

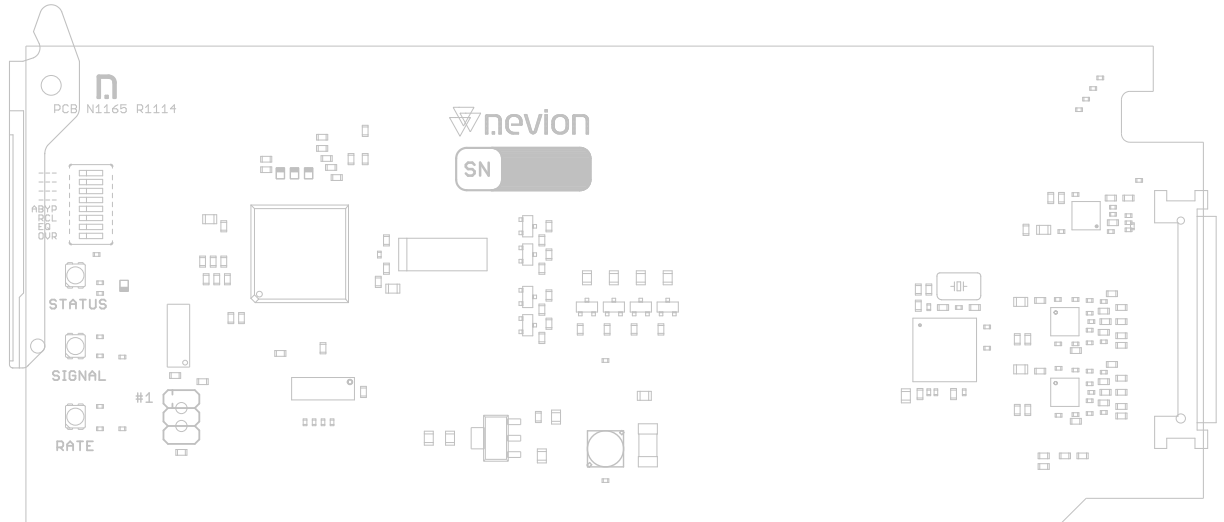


Figure 2: DA-3GHD-8-PL/DA-3GHD-8 module layout

DIP switch configuration must be set according to Table 1:

Switch #	Label	Function DIP=OFF	Function DIP=ON	Comment
1	---			
2	---			
3	---			
4	---			
5	ABYP	No auto bypass	Reclocker bypass if unsupported bitrate	Auto bypass of reclocker
6	RCL	Reclocker Bypass	Reclocker ON	Reclocker mode
7	EQ	Cable equalizer Bypass	Cable equalizer ON	Equalizer mode
8	OVR	GYDA control Config. with GYDA	Override GYDA control Config. with DIP switch	Select GYDA config. mode

Table 1: DA-3GHD-8-PL/DA-3GHD-8 DIP switches

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

3.1 Configuration Examples

Typical configurations for DA-3GHD-8-PL/DA-3GHD-8:

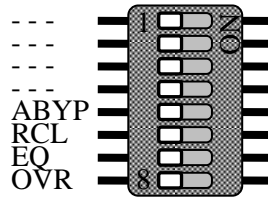


Figure 3: Default all off; Gyda controls the card

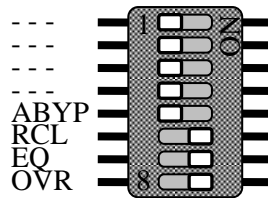


Figure 4: DIP control; Equalizing and reclocking turned on

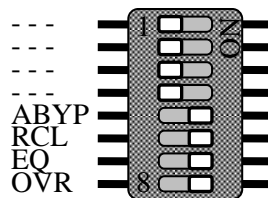


Figure 5: Same as above, but if the input signal is something else than the supported bit-rates, the reclocker will automatically enter bypass mode

4 Connections

Both module versions have a dedicated connector backplane which is mounted at the rear of the sub-rack. The backplane layout is shown in Figure 6.

Due to signal performance discrepancies in slot 1 (leftmost position), slot 1 may not be used with this product for 3G-SDI.

HD, SD and ASI meets is not affected and meets their respective performance specifications.

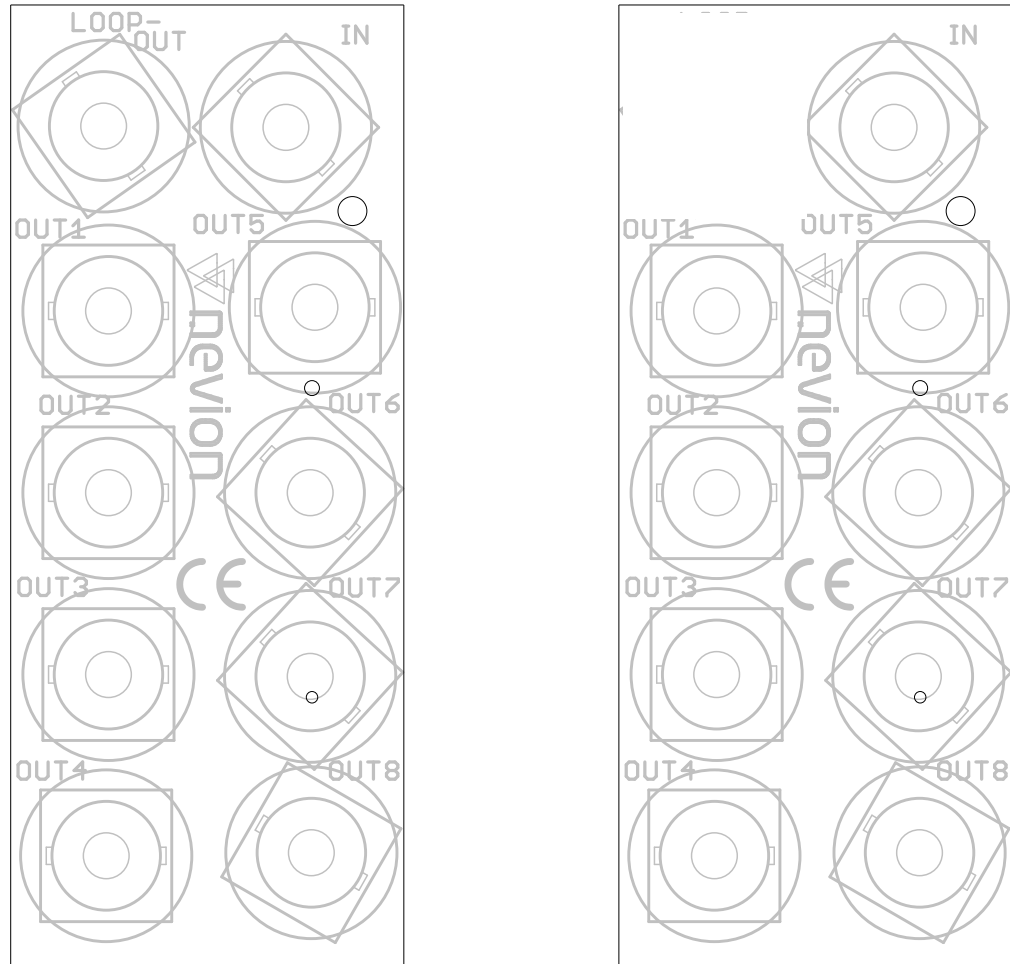


Figure 6: Layout of the backplanes DA-3GHD-8-PL-C1 and DA-3GHD-8-C1.

The electrical input signal is connected to the IN BNC. On the -PL version the signal is then passively looped to the LOOP-OUT BNC. The LOOP-OUT BNC must not be left open, if it is not connected to another DA-3GHD-8-PL-C1 backplane, it must be equipped with a good quality 75ohm termination. All OUT1 to OUT8 BNC's provides non-inverted signals and can be used for all formats, included DVB-ASI. Unused outputs should be terminated with 75ohm.

Note: In an application with two or three distribution cards looped together, the source SDI-signal will travel through several BCN connector interconnects. It is therefore very important that those connectors are of good quality and specified for the bitrate used. Only new and fresh interconnection equipment should be used. This is especially important to 3G-SDI.

See the following drawings for illustration of how the DA-3GHD-8-PL modules are looped together:

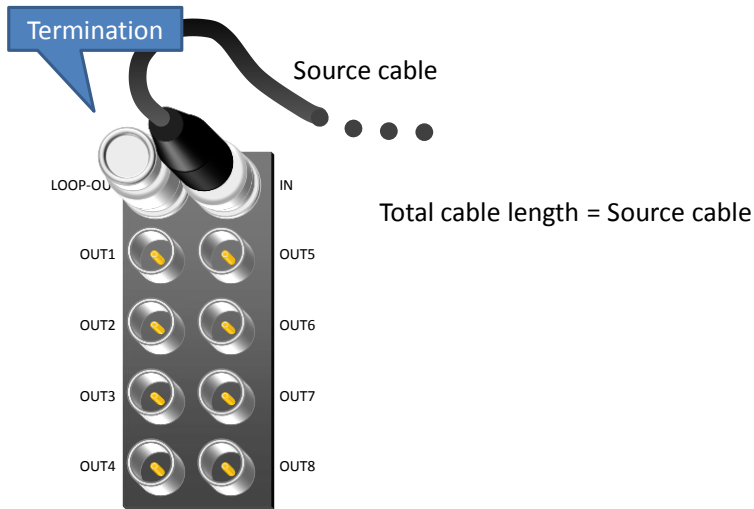


Figure 7: Single module

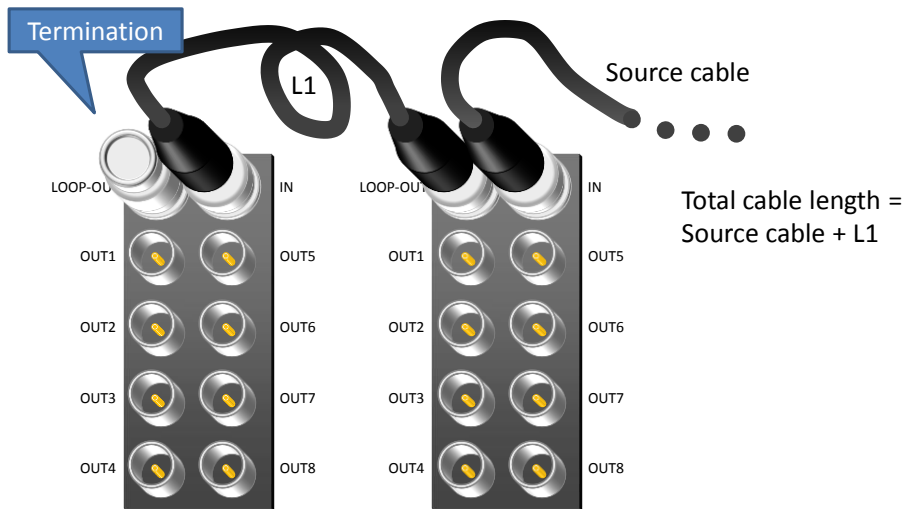


Figure 8: Two modules looped

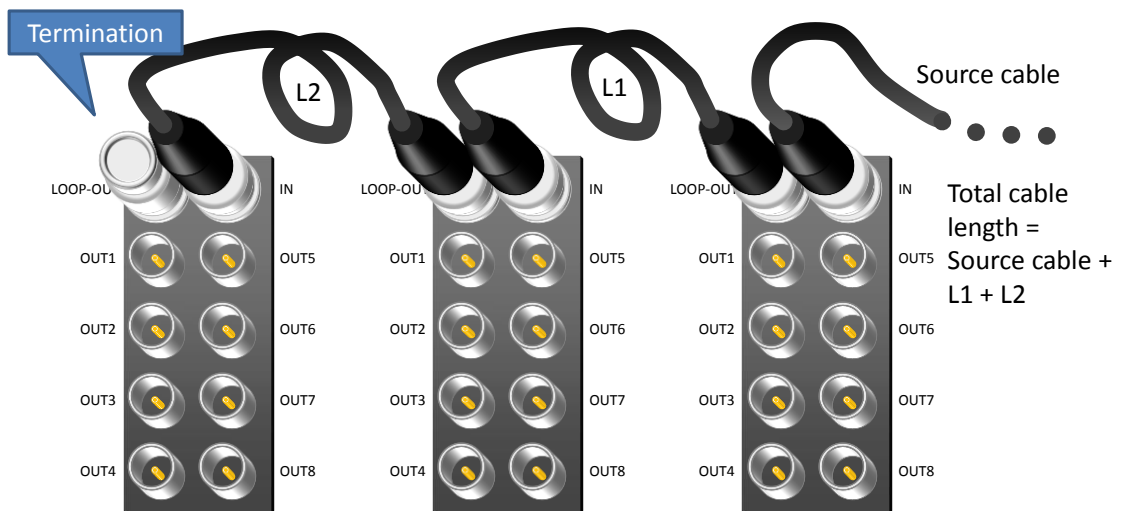


Figure 9: Three modules looped

5 Operation

The status of the module can be easily monitored visually by LED's at the front of the module. The LED's are visible through the front panel as shown in Figure 10.

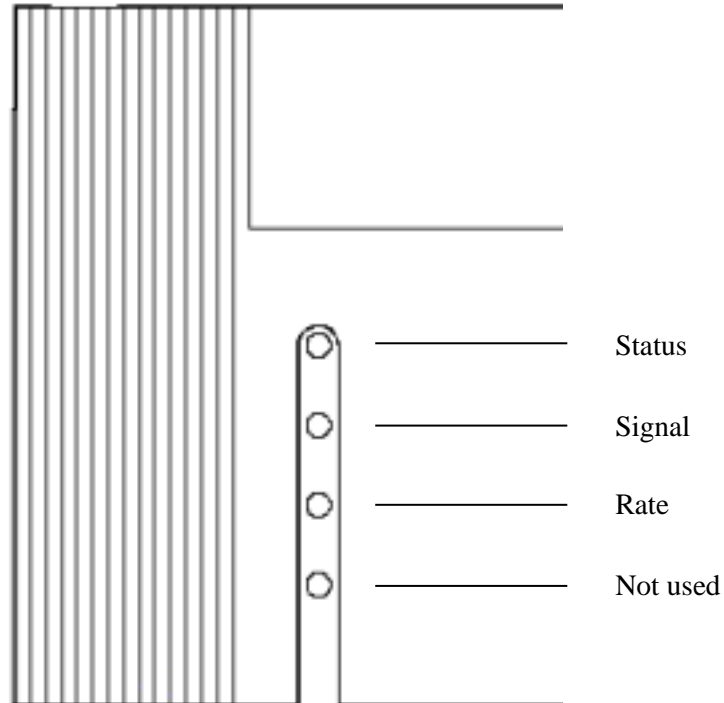


Figure 10: Panel indicator overview for DA-3GHD-8-PL/DA-3GHD-8 (text not printed on the front panel).

The functions of the different LED's are described in Table 2.

Diode \ state	Red LED	Yellow LED	Green LED	No light
Status	Module is faulty		Module is OK Module has power	Module has no power
Signal	No input signal	EQ bypassed or muted	Input signal present	
Rate	Rate not detected	Recl. bypassed	Reclocker locked	
Fourth LED not used				

Table 2: LED status description

General environmental requirements for Nevion equipment

1. The equipment will meet the guaranteed performance specification under the following environmental conditions:
 - Operating room temperature 0°C to 50°C
range:
 - Operating relative humidity range: <90% (non-condensing)

2. The equipment will operate without damage under the following environmental conditions:
 - Temperature range: -5°C to 55°C
 - Relative humidity range: <95% (non-condensing)

Product Warranty

The warranty terms and conditions for the product(s) covered by this manual follow the General Sales Conditions by Nevion, which are available on the company web site:

www.nevion.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)	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-3GHD-8-PL DA-3GHD-8	○	○	○	○	○	○
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.						

This is indicated by the product marking:



A.2 Recycling information

Nevion provides assistance to customers and recyclers through our web site <http://www.nevion.com/>. Please contact Nevion’s 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 Nevion 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 labeled 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.