

USER MANUAL

 **Indigo**
SYSTEM



3GDA105 and 3GDA111

3G/HD/SD distribution amplifiers

Crystal  **Vision**

Contents

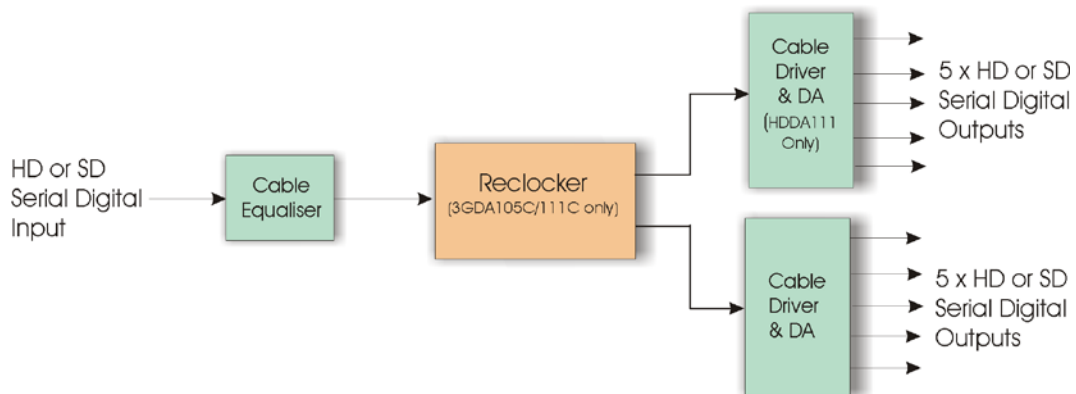
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Revision 1	Card edge label amended (page 8).	24/02/09
Revision 2	Removed 4U frame information. Updated the GPI table on page 4. Updated the card edge picture on page 7.	10/02/21

1 Introduction

The 3GDA105/111 is a family of 3G High Definition distribution amplifiers, which can distribute 3G HD, HD or SDI signals. Depending on the configuration of each version, these 3G HD distribution amplifiers provide five relocked or non-relocked outputs or by the addition of a sub PCB eleven relocked or non-relocked outputs. Auto input cable equalisation and output drivers ensure an SD cable length of in excess of 250 metres with Belden 8281 or equivalent and up to 140 meters for HD and 80 metres for 3G HD with Belden 1694 or equivalent is obtainable.

The universal connection system allows a mixture of Crystal Vision modules in the frame. The modules plug in the front and the rear connectors plug in the rear. Depending on frame design, a hinged or removable front panel reveals LED and switch positions as an indication of input present, HD/SD and PSU status when opened.



3GDA105/111 multi-standard distribution amplifiers

The 3GDA105/111 family consists of four models. The two basic models are the 3GDA105C one in five out relocking DA and the 3GDA105N one in five out non-relocking DA. The addition of a six output sub PCB increases the total number of outputs available to eleven as specified in the 3GDA111C and 3GDA111N respectively. The 3GDA105N and 3GDA111N versions were made obsolete in 2018.

For simplicity all four boards have no comms ability and where user configurable, they are configured via an on-board link or switch.

The 3GDA105C/N use the RM41 single-slot rear connector with six BNC connectors, the 3GDA111C/N use the addition of a RM34 in the slot above to increase the number of outputs to eleven.

The 3GDA family of boards is very compact with up to 12 modules fitting in a 2U frame when a single slot rear connector is used.

The rear connector details may be found in the Installation chapter.

The main features are as follows:

- Up to one in eleven out HD/SD relocking or non-relocking.
- Automatic input cable length equalisation.

2 Hardware installation

The 3GDA105/111 digital video distribution amplifiers fit into all Crystal Vision rack frames. All modules can be plugged in and removed while the frame is powered without damage.

2.1 Universal rear connectors

The 3GDA105C and 3GDA105N use a single height rear connector, this will allow the 2U Indigo 2 frame to house 12 modules and dual power supplies. The 1U Indigo 1 will house six modules with a single power supply. The Indigo DT desk top box has a built-in power supply and will house up to two modules.

The 2U and 1U frames all have a hinged front panel that gives access to the PSUs and all modules. The desk top box also has a removable front to gain access to the modules. The universal frame wiring system allows any of the interface range of modules to be fitted in any position with the use of removable rear modules.

The 3GDA111C and 3GDA111N use a second single slot rear connector to obtain the full number of outputs, this means that packing density will be reduced.

Rear module connections with RM41 and RM34

3GDA105C/3GDA105N

RM41 fits in all frames	Description
	RM41 <ul style="list-style-type: none"> • 12 modules in 2U • 6 in 1U • 2 in a DTB • All frame slots can be used

BNC	I/O assignment
HD SDI IN	HD/SD serial digital input
HD SDI OUT(A)	HD/SD serial digital output
HD SDI OUT(B)	HD/SD serial digital output
HD SDI OUT(C)	HD/SD serial digital output
HD SDI OUT(D)	HD/SD serial digital output
HD SDI OUT(E)	HD/SD serial digital output

3GDA111C/3GDA111N

RM34 + RM41 fits in all frames	Description
	RM34 + RM41 <ul style="list-style-type: none"> • 6 in 2U • 3 in 1U • 1 in a DTB • 2 slots used for each card

BNC	I/O assignment
HD SDI IN	HD/SD serial digital input
HD SDI OUT(A)	HD/SD serial digital output
HD SDI OUT(B)	HD/SD serial digital output
HD SDI OUT(C)	HD/SD serial digital output
HD SDI OUT(D)	HD/SD serial digital output
HD SDI OUT(E)	HD/SD serial digital output
HD SDI OUT(F)	HD/SD serial digital output
HD SDI OUT(G)	HD/SD serial digital output
HD SDI OUT(H)	HD/SD serial digital output
HD SDI OUT(I)	HD/SD serial digital output
HD SDI OUT(J)	HD/SD serial digital output
HD SDI OUT(K)	HD/SD serial digital output

2.2 General purpose interface

The external GPI control lines 'a' to 'f' at the frame remote connectors are provided to allow remote control and/or remote status indication. Line 'a' is assigned as a GPI output to provide remote indication of input presence.

The GPI output is fitted with 6k8Ω pull-up to +5V and 270Ω series resistor so it can drive an LED directly. If the series resistor is shorted out, it can drive a bulb at +45V 500mA max.

GPI Connections

	Not asserted (nominally 5Vdc)	Asserted (<0.5Vdc)
'a'	No input	Input present
'b'	PSU fault	PSU Ok
'c'		SD input present ('C' version only)
'd'		HD input present ('C' version only)
'e-f'	Not assigned	Not assigned

The following tables show the GPI pinout for each frame:

2U frame GPI Connections

GPI lines 'a' to 'f' of each card connect to one of four rear remote connectors as follows:

Slot no.	'a' pin	'b' pin	'c' pin	'd' pin	'e' pin	'f' pin
1	8 (1)	9 (1)	18 (1)	26 (1)	19 (2)	20 (2)
2	7 (1)	16 (1)	17 (1)	25 (1)	10 (2)	11 (2)
3	8 (3)	9 (3)	18 (3)	26 (3)	19 (4)	20 (4)
4	7 (3)	16 (3)	17 (3)	25 (3)	10 (4)	11 (4)
5	5 (1)	6 (1)	15 (1)	24 (1)	1 (2)	2 (2)
6	4 (1)	14 (1)	13 (1)	23 (1)	3 (2)	4 (2)
7	5 (3)	6 (3)	15 (3)	24 (3)	1 (4)	2 (4)
8	4 (3)	14 (3)	13 (3)	23 (3)	3 (4)	4 (4)
9	3 (1)	12 (1)	22 (1)	21 (1)	12 (2)	13 (2)
10	10 (1)	11 (1)	19 (1)	20 (1)	21 (2)	22 (2)
11	3 (3)	12 (3)	22 (3)	21 (3)	12 (4)	13 (4)
12	10 (3)	11 (3)	19 (3)	20 (3)	21 (4)	22 (4)

Table shows Pin number (Remote number)

Note: Remote 1 and Remote 3 are 26 way high-density D-Type female sockets. Frame ground is pin 2 and +5V @500mA is pin 1 in each case.
Remote 2 and Remote 4 are 26 way high-density D-Type male plugs and frame ground is pin 6 in each case and +5V @500mA is pin 15 on Remote 2.
The +5V output is protected by self-resetting thermal fuses, which limit the total output current available from Remotes 1-4 to approximately 1A.

1U frame GPI connections

GPI lines 'a' to 'f' of each card connect to one of two rear remote connectors as follows:

Slot no.	'a' pin	'b' pin	'c' pin	'd' pin	'e' pin	'f' pin
1	8 (1)	9 (1)	18 (1)	26 (1)	19 (2)	20 (2)
2	7 (1)	16 (1)	17 (1)	25 (1)	10 (2)	11 (2)
3	5 (1)	6 (1)	15 (1)	24 (1)	1 (2)	2 (2)
4	4 (1)	14 (1)	13 (1)	23 (1)	3 (2)	4 (2)
5	3 (1)	12 (1)	22 (1)	21 (1)	12 (2)	13 (2)
6	10 (1)	11 (1)	19 (1)	20 (1)	21 (2)	22 (2)

Table shows Pin number (Remote number)

Note: Remote 1: 26 way high-density D-Type female socket. Frame ground is pin 2 and +5V @500mA is pin 1.
Remote 2: 26 way high-density D-Type male plugs and frame ground is pin 6 and +5V @500mA is pin 15
The +5V output is protected by self-resetting thermal fuses, which limit the total output current available from Remotes 1-2 to approximately 1A.

Indigo DT desk top box GPI connections

GPI lines 'a' to 'f' of each card connect to the rear remote connector as follows:

Slot no.	'a' pin	'b' pin	'c' pin	'd' pin	'e' pin	'f' pin
1	8 (1)	9 (1)	18 (1)	26 (1)	19 (2)	20 (2)
2	7 (1)	16 (1)	17 (1)	25 (1)	10 (2)	11 (2)

Table shows pin number (remote number)

Note: Remote 1: 26 way high-density D-Type female socket. Frame ground is pin 2 and +5V @500mA is pin 1.
 Remote 2: 26 way high-density D-Type male plugs and frame ground is pin 6 and +5V @500mA is pin 15
 The +5V output is protected by self-resetting thermal fuses, which limit the total output current available from Remotes 1-2 to approximately 1A.

3 Card edge operation

3GDA105C/3GDA111C

The front card-edge of the 3GDA105C/3GDA111C provides power rail monitoring and signal status.



3GDA105C front edge view

LED	Location/colour	Meaning when lit
HD-SD	Yellow	Valid input and standard detected.
PSU Ok	Green	Power supply voltages present.

The 3GDA105C will auto detect the input standard and illuminate the appropriate LED accordingly.

Note: Input missing is indicated by both HD and SD LED being unlit

3GDA105N/3GDA111N

The front card-edge of the 3GDA105N/3GDA111N provides power rail monitoring, signal status and input standard selection.



3GDA105N front edge view

LED	Location/colour	Meaning when lit
Input Present	Green	Valid DVB-ASI/SDI input detected.
PSU Ok	Green	Power supply voltage present.

The card edge switch is used to select the output drivers slew rates to match the input signal i.e. Standard Definition or High Definition.

4 Trouble shooting

Card edge monitoring

The card edge provides simple monitoring of the board status. This can be used as an initial aid to trouble shooting.

Fault finding guide

The Power OK LEDs are not illuminated

Check that the frame PSU is functioning – refer to the appropriate frame manual for detailed information

Check that the card is seated correctly in the frame

There is no video output

Check that a valid video input is present (input present LED illuminated) and that any cabling is intact

The video output is low quality

Check that the maximum length has not been exceeded

Check that the HD/SD switch is set in the correct position for the input video ('N' version only)

5 Specification

General

Dimensions	100mm x 266 mm module with DIN 41612 connector
Weight	
3GDA105	140g
3GDA111	200g
Power consumption	
3GDA105C	3.2W
3GDA111C	5.6W
3GDA105N	2.8W
3GDA111N	5.2W

Inputs

Video	HD or SD SDI 270Mb/s to 2.970Gb/s serial digital compliant to SMPTE-259M, SMPTE-292M SMPTE-424M
	Cable equalisation:
	3G (2.970Gb/s) – 80 metres, Belden 1694 or equivalent
	HD (1.485Gb/s) – 140 metres, Belden 1694 or equivalent
	SD (270Mb/s) >250 metres, Belden 8281 or equivalent

Outputs

3GDA105C	5 off HD or SD SDI 270Mb/s to 2.970Gb/s serial digital compliant to SMPTE-259M, SMPTE-292M and SMPTE-424M
3GDA111C	11 off HD or SD SDI 270Mb/s to 2.970Gb/s serial digital compliant to SMPTE-259M, SMPTE-292M and SMPTE-424M
3GDA105N	5 off HD or SD SDI 270Mb/s to 2.970Gb/s serial digital compliant to SMPTE-259M, SMPTE-292M and SMPTE-424M
3GDA111N	11 off HD or SD SDI 270Mb/s to 2.970Gb/s serial digital compliant to SMPTE-259M, SMPTE-292M and SMPTE-424M

Control and status

Indicators	Board edge LEDs for PSU ok and signal present
GPI outputs	20ff PSU ok and signal present
Controls	Board edge switch for output slew rate