HDDA105 and HDDA111

HD/SDI Distribution Amplifiers

USER MANUAL

Crystal Vision

Crystal Vision Ltd., Lion Technology Park, Station Road East, Whittlesford, Cambridge, CB22 4WL, England.
E-mail: sales@crystalvision.tv Website: www.crystalvision.tv Tel: +44(0) 1223 497049 Fax: +44(0) 1223 497059

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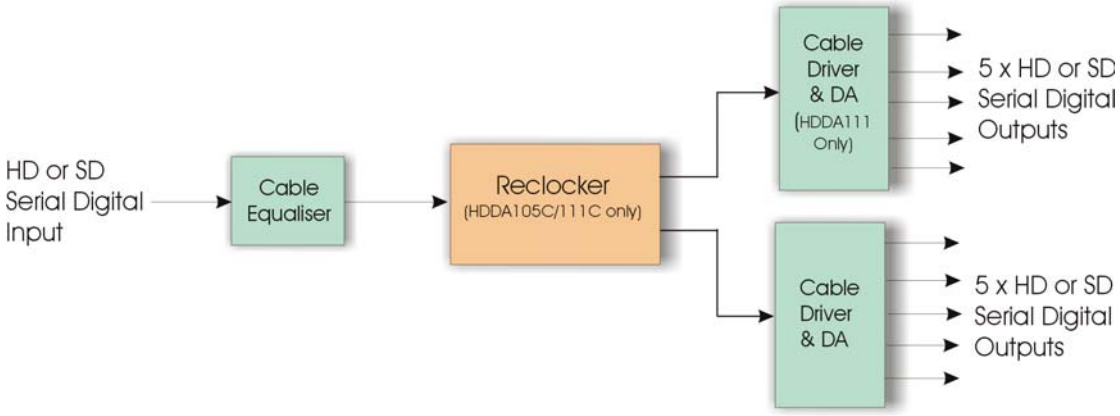
1 Introduction

The HDDA105/111 family of multi-standard High Definition / Standard Definition serial digital distribution amplifiers, which depending on configuration, can provide one in five out or by the addition of a sub PCB one in eleven out, reclocking or non-reclocking. The non-reclocking is DVB-ASI compatible. Auto input cable equalisation and output drivers ensure an SD cable length of in excess of 250 meters with Belden 8281 or equivalent and up to 140 meters for 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.



HDDA105/111 multi-standard distribution amplifiers

The HDDA family consists of four models. The two basic models are the HDDA105C one in five out reclocking DA and the HDDA105NA one in five out non-reclocking DA. The addition of a six output sub PCB increases the total number of outputs to eleven specified as the HDDA111C and HDDA111NA respectively. For simplicity all four boards have no comms ability and where user configurable, they are configured via an on-board link or switch.

The HDDA105C/NA use the RM34 single-slot rear connector with six BNC connectors, the HDDA111C/NA use the addition of a second RM34 in the slot above to increase the number of outputs to eleven.

The HDDA family of boards is very compact with 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 reclocking or non-reclocking.
- Automatic Input cable length equalisation
- NA variant BVD-ASI compatible.

2 Hardware installation

The HDDA105/111 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

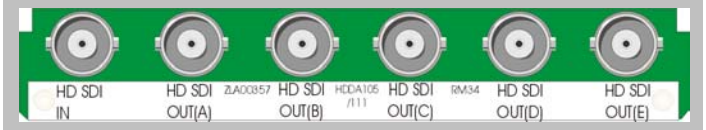
The HDDA105C and HDDA105NA use a single height rear connector, this will allow the 4U Indigo frame to house up to 24 modules and three power supplies, the 2U Indigo 2 frame will house 12 modules and dual power supplies. The 1U Indigo 1 will house six modules with a single power supply. The Indigo DT Desk Top Box has a built-in power supply and will house up to two modules.

The 4U, 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 HDDA111C and HDDA111NA 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 RM34

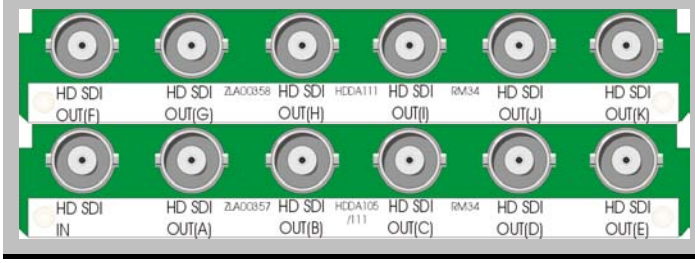
HDDA105C/HDDA105NA

RM34 fits in all frames	Description
	**RM34** • 24 modules in 4U • 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

Note. The HDDA105NA outputs are DVB-ASI compliant

HDDA111C/HDDA111NA

RM34 fits in all frames	Description
	**RM34 x 2** • 12 modules in 4U • 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

Note. The HDDA105NA outputs are DVB-ASI compliant

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 270Ωseries 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'	HD Input (HDDA105NA/HDDA111NA not used)	SD Input (HDDA105NA/HDDA111NA not used)
'd'	Not assigned	Not assigned
'e'	Not assigned	Not assigned
'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 and 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 and +5V @500mA is pin 15 in each case.

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 socket. Frame ground is pin 2 and +5V @500mA is pin 1.
Remote 2: 26 way high density D-type plug. Frame ground is pin 6 and +5V @500mA is pin 15.

DTB GPI connections

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

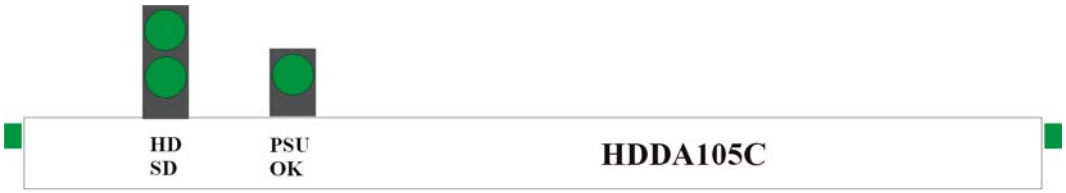
Slot no.	'a' pin	'b' pin	'c' pin	'd' pin	'e' pin	'f' pin
1	1	2	3	4	5	6
2	9	10	11	12	13	14

Note: Remote connector is 15 way normal density D-type socket. Frame ground is pin 15.

3 Card edge operation

HDDA105C/HDDA111C

The front card-edge of the HDDA105C/HDDA111C provides power rail monitoring and signal status.



HDDA105C front edge view

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

The HDDA105C will auto detect the input standard and illuminate the appropriate LED accordingly. No input will cause both LEDs to be unlit.

HDDA105NA/HDDA111NA

The front card-edge of the HDDA105NA/HDDA111NA provides power rail monitoring, signal status and input standard selection.

HDDA105NA 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 mode of operation 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 (HDDA105/111NA) is set in the correct position for the input video

5 Specification

General

Dimensions	100mm x 266 mm module with DIN 41612 connector
Weight	
HDDA105	140g
HDDA111	200g
Power consumption	
HDDA105C	3.2W
HDDA111C	5.6W
HDDA105NA	2.8W
HDDA111NA	5.2W

Inputs

Video	HD or SD SDI 270Mb/s to 1.485Gb/s serial digital compliant to SMPTE-259M and SMPTE-292M
	Cable equalisation, Belden 8281 or equivalent
	HD (1.485Gb/s) – 100 meters
	SD (270Mb/s) >250 meters

Outputs

HDDA105C	5 off HD or SD SDI 270Mb/s to 1.485Gb/s serial digital compliant to SMPTE-259M and SMPTE-292M
HDDA111C	11 off HD or SD SDI 270Mb/s to 1.485Gb/s serial digital compliant to SMPTE-259M and SMPTE-292M
HDDA105NA	5 off HD or SD SDI 270Mb/s to 1.485Gb/s serial digital compliant to SMPTE-259M, SMPTE-292M and DVB-ASI capable
HDDA111NA	11 off HD or SD SDI 270Mb/s to 1.485Gb/s serial digital compliant to SMPTE-259M, SMPTE-292M and DVB-ASI capable

Ordering information

HDDA105C	1 in 5 out multi-standard reclocking distribution amplifier
HDDA111C	1 in 11 out multi-standard reclocking distribution amplifier
HDDA105NA	1 in 5 out multi-standard non-reclocking distribution amplifier
HDDA111NA	1 in 11 out multi-standard non-reclocking distribution amplifier

Rear Connectors

RM29	Single height rear connector

Frames

Indigo 4	4U frame with passive front panel for up to 24 modules
Indigo 2	2U frame with passive front panel for up to 12 modules
Indigo 1	1U frame with passive front panel for up to six modules
Indigo DT	Desk top box with passive front panel for up to two modules
Indigo 2A	2U frame, Statesman enabled with active control panel for up 12 modules
Indigo 1A	1U frame, Statesman enabled with active control panel for up six modules
Indigo DTA	Desk top box, Statesman enabled with active control panel for up two modules
Indigo 4S	4U frame with passive front panel fitted with Statesman CPU for up to 24 modules
Indigo 2S	2U frame with passive front panel fitted with Statesman CPU for up to 12 modules
Indigo 1S	1U frame with passive front panel fitted with Statesman CPU for up to six modules
Indigo DTS	Desk top box with passive front panel fitted with Statesman CPU for up to two 2 modules
Indigo 2-48V	48V 2U frame with passive front panel for up to 12 modules
Indigo 1-48V	48V 1U frame with passive front panel for up to six modules
Indigo 2A-48V	48V 2U frame, Statesman enabled, with active control panel for up 12 modules
Indigo 1A-48V	48V 1U frame, Statesman enabled, with active control panel for up six modules
Indigo 2S-48V	48V 2U frame with passive front panel fitted with Statesman CPU for up to 12 modules
Indigo 1S-48V	48V 1U frame with passive front panel fitted with Statesman CPU for up to six modules