3GDA105R and 3GDA111R

3G/HD/SD distribution amplifiers

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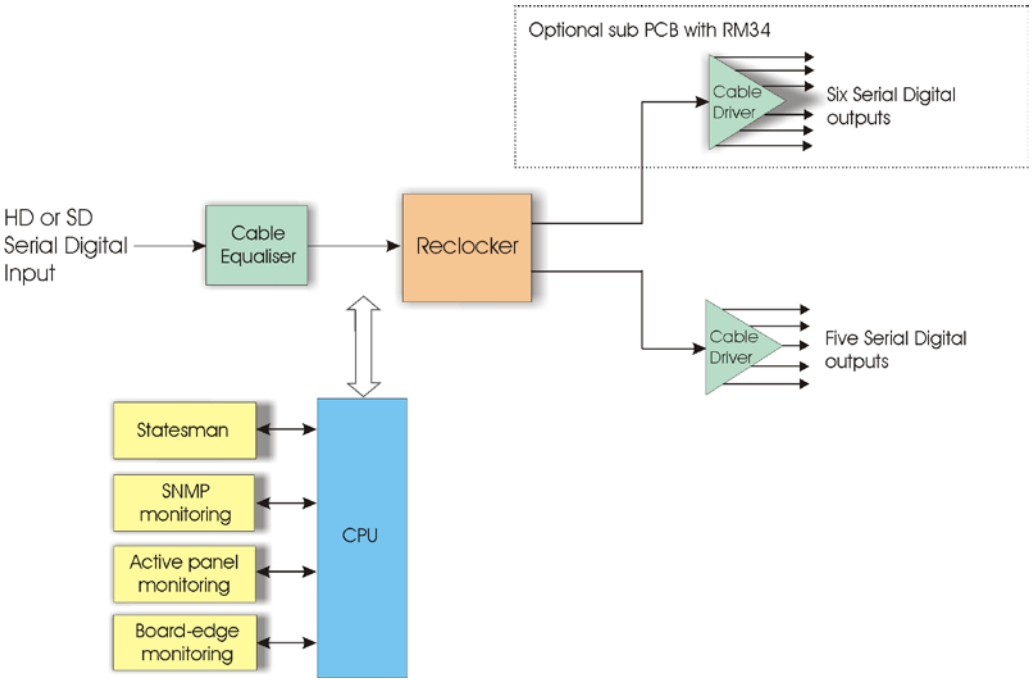
Revision 1. Statesman diagrams updated to show board type. 02-05-12

1 Introduction

The 3GDA105R/111R are 3G High Definition distribution amplifiers, which can distribute reclocked 3G HD, HD or SDI signals with remote monitoring. The 3GDA105R provides five reclocked outputs or by the addition of a sub PCB the 3GDA111R will give eleven reclocked outputs. 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 and 80 meters for 3GHD 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.



3GDA105R/111R multi-standard distribution amplifiers

The 3GDA105R uses the RM41 single-slot rear connector with six BNC connectors, the 3GDA111R uses the addition of an RM34 in the slot above to increase the number of outputs to eleven.

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

The main features are as follows:

- Up to one in eleven HD/SD reclocked outputs.
- Automatic Input cable length equalisation.
- Remote monitoring via the Statesman PC control system and frame active control panel.

2 Hardware installation

The 3GDA105R and 3GDA111R 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

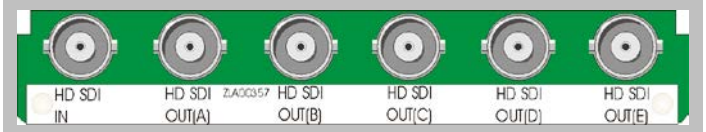
The 3GDA105R uses a single height rear connector, this will allow the 4U Indigo frame to house up to 24 modules and three power supplies, the 2U Indigo 2 frame will house 12 modules and dual power supplies. The 1U Indigo 1 will house six modules with a single power supply. The Indigo DT Desk Top Box 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 3GDA111R uses a second single slot rear connector to obtain the full number of outputs; this will result in fewer boards per frame type.

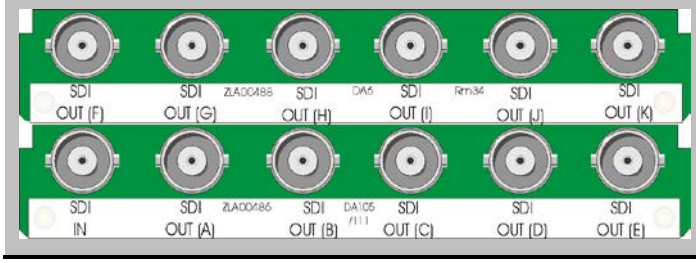
Rear module connections with RM41 and RM34

3GDA105R

RM41 fits in all frames	Description
	**RM41** • 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

3GDA111R

RM34 & RM41 fits in all frames	Description
	**RM34 & RM41** • 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

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
'd'		HD input present
'e-f'	Not assigned	Not assigned

The following tables show the GPI pinout for each frame:

4U frame GPI connections

GPI lines ‘a’ to ‘f’ of each card connect to one of eight rear remote connectors as follows:

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

Table shows pin number (Remote number)

Note: Remote 1, Remote 3, Remote 5 and Remote 7 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, Remote 4, Remote 6 and Remote 8 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 and Remote 6.

The +5V output is protected by self-resetting thermal fuses, which limit the total output current available from Remotes 1-4 to approximately 1A. Remotes 5-8 are similarly protected.

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

3GDA105R/3GDA111R

The front card-edge of the 3GDA105R/3GDA111R provides power rail monitoring and signal status.

3GDA105R 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 3GDA105R 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

4 Using the front control panel

4.1 Module selected

This operational guide assumes that the panel has been set up according to the panel setup procedure described in the Crystal Vision Control Panel manual.

Note: It is **ESSENTIAL** that the panel set up procedure is followed and any old or unknown passwords cleared prior to using the panel for the first time.

At power up all eight control panel keys LEDs will illuminate briefly. Once the panel has completed its power up and configuration sequence the panel will enter Statesman mode and the message 'Press Cal to Exit' will be displayed.

Statesman mode is entered by default

To continue with control panel operation or configuration, press the CAL key once. A second press of the CAL key will return to Statesman control.

The control panel will display the name of the card that first responds to the polling request together with its location number.

The location number consists of the frame number plus the card position in the frame.

Navigating the display

The functions assigned to control panel keys are:

- DEVICE – enters Device menu to select a card or show cards available/enters panel set up when held down during power up/shows frame status when pressed from Statesman mode
- CAL – enters or leaves Statesman mode/enters Panel Diagnostics mode when held down during power up/updates the display
- Asterisk – enters board rename menu from the Device menu
- F1 to F4 – soft keys, function assigned within each menu
- HOME – moves the display to the Home menu
- ENTER – accept current selection
- Upward arrow – used to move up the menu structure/enter lock panel menu from the Device menu

- Rotary control – shaft encoder used to select options or variable data

Note: Please refer to the Crystal Vision Control Panel manual for details of the Panel Setup, Lock Panel and Diagnostic menus.

Selecting a 3GDA105R

To select a particular card in a frame, press the DEVICE key to go to the Device menu.

Note: There may be a delay whilst the frame is interrogated during which time 'No cards Found' could be displayed.

The top line of the display will show 'Available Cards X', where X is the number of cards that have responded so far to the polling request.

The available cards menu

Rotate the shaft encoder and the bottom row will display the successfully polled cards by name and location or slot number.

In the example above, the card displayed is located in the first frame in slot number 1.

When the desired card is selected press the ENTER key to access that card's HOME menu. The message shows that a 3GDA105R has been selected.

Note: 3GDA105R will also be displayed where a 3GDA111R is fitted as the active control panel can not determine if an output extender PCB has been fitted.

The 3GDA105R home menu

Updating the display

The values displayed on an active front panel are only updated when an adjustment is made and when changing menu level. If changes occur through the use of card edge controls or other remote control, the text displayed on the active front panel will not be updated immediately. If necessary, use the upward arrow to leave and then re-enter a menu to update the display.

4.2 The 3GDA105R active panel menu structure

At any time the main top-level menu (Home) is obtained by pressing the HOME key. From the Home menu further selections can be made. Active function keys are indicated by illuminated, integrated LEDs.

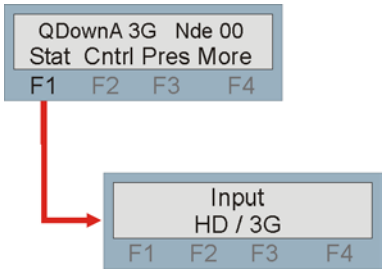
The main top-level menu for the 3GDA105R is obtained by pressing the F1 key from the Home menu.

The top-level menu is:

- Status – Press F1

The following chart shows the available 3GDA105R menus. The actual menus available may vary slightly as software is updated.

Active control panel menus

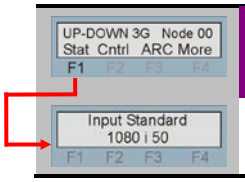


Note: Function key LEDs are illuminated when active.

The Status menu

Pressing button F1 from the Home menu will enter the Status menu. This menu is traversed by rotating the shaft control. No changes can be made from this read only menu.

Note: Not all status information will be updated in real time. If necessary press the * button to cause the display to update.

	Menu	Description
	Input status	Press F1 to view the input status. ***HD/3G, SD, Input Missing.***

5 Statesman

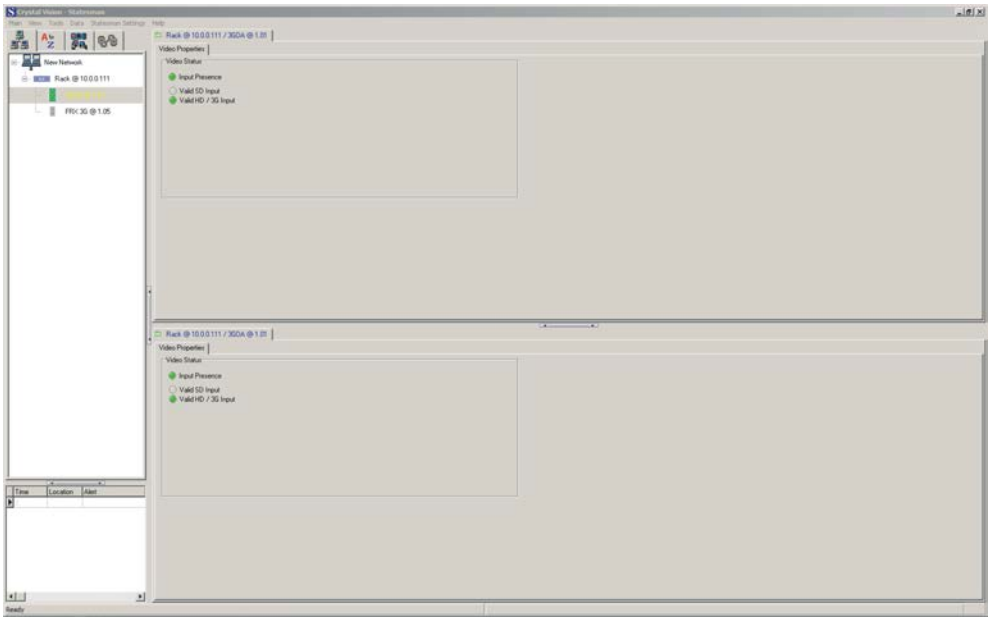
5.1 Statesman introduction

The Crystal Vision Statesman PC control software is designed to control a range of Crystal Vision modules via serial control from a PC. Statesman provides a user friendly means of configuring and operating Crystal Vision modules with the benefit of "see-at-a-glance" status monitoring.

The main Statesman application communicates with each module in a frame through a Statesman capable or active control panel. An active panel or REMIND remote control panel must be fitted to allow Statesman control.

5.2 Statesman operation

The initial view will show an Explorer style view of the connected frames and modules. Double clicking on a module will enable the display of the main application menus.



Statesman main application window

The two large control panes shown in the upper and lower halves of the window may display different menus for the same card, or controls for different cards. Click on the horizontal button-bar between the two panes to close the lower pane or drag the button to vary the size of the panes.

Note: For further details of Statesman configuration and operation please refer to the Statesman manual.

Status

The board status is shown using a mixture of simulated LEDs and text information. As a general rule a green LED shows a good condition such as input present. An amber LED will give a warning. If an LED turns red this is a fault condition so input present will turn red if the input should go away. A greyed LED will indicate an absence such as non-alarm or non-warning status.

Text is used where more information is required than can be inferred by a simple LED such as video standards.

Status monitoring

6 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.

3GDA105R front edge view

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

Fault finding guide

The Power OK LED is 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

7 Specification

General

Dimensions	100mm x 266 mm module with DIN 41612 connector
Weight	
3GDA105R	140g
3GDA111R	200g
Power consumption	
3GDA105R	5.6W
3GDA111R	8W

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 meters, Belden 1694A or equivalent HD (1.485Gb/s) – 140 meters, Belden 1694A or equivalent SD (270Mb/s) >250 meters, Belden 8281 or equivalent

Outputs

3GDA105R	5 off HD or SD SDI 270Mb/s to 2.970Gb/s serial digital compliant to SMPTE-259M, SMPTE-292M and SMPTE-424M
3GDA111R	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

Indictors	Board edge LEDs for PSU ok and signal present
GPI outputs	Four - Input present, PSU OK, Input standard SD and Input 3G/HD