Innovation in the
Multi-Screen World

User Manual

Aurora

Router Control System

Contents

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1. Introduction

Aurora is a self contained router control system capable of supporting a number of remote control devices and matrices. For fail-safe operation in transmission environments, redundancy is obtained by fitting dual processor cards and dual power supplies.

Each processor can be expanded within the main frame by adding an expander card via an internal ribbon connector. Further expansion is possible by cascading up to eight expansion frames. Each expansion frame can be fitted with up to two expander cards per processor.

The flexible assignment system allows the 32 assignable ports on a single frame to support a variety of configurations. Normal configuration is for 16 control device ports, 16 matrix ports and three remote control ports.

Smaller systems with fewer sub-boards and therefore less assignable ports can be built and easily expanded later.

The full feature list is as follows:

- Up to 32 assignable RS485 serial ports, 16 cue inputs and 32 cue outputs per main 6006 frame
- Serial ports may be assigned to remote control, matrix and panel devices
- Main and backup controller boards with controller expansion option
- Expansion ports to cascade up to eight 6006 expansion frames
- A fully expanded system can support up to 288 assignable serial ports, 144 cue inputs and 288 cue outputs
- Component analogue video output for status display
- Active/standby control
- Timecode lock
- Two dedicated configuration and remote ports
- Multi-standard reference loop through input
- External power supply monitoring port

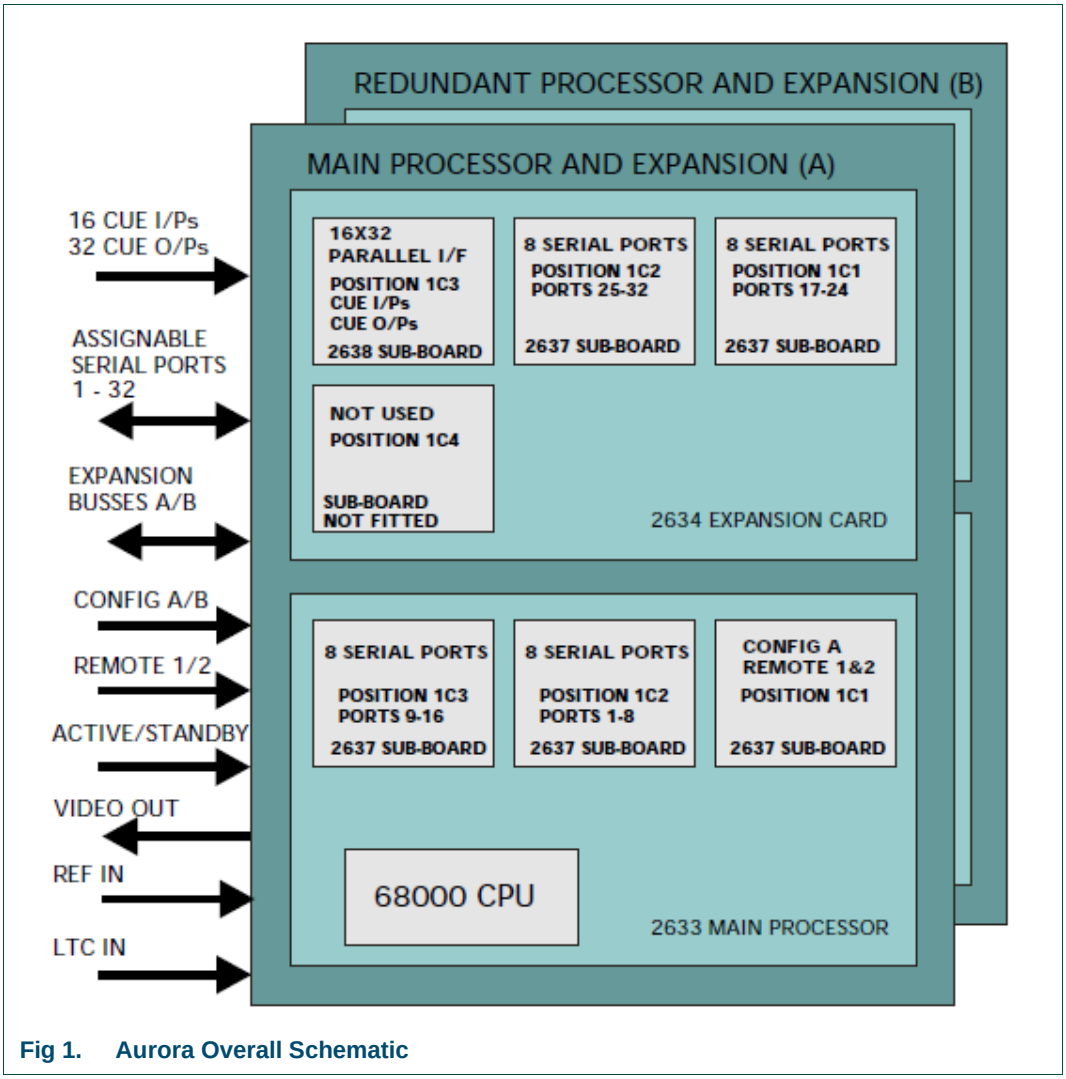


Fig 1. Aurora Overall Schematic

2. Installation

The 3U rack may be configured with a total of four main cards. Each card can accept sub-boards according to the number of ports and the degree of redundancy required. It is highly recommended to install a main and backup controller and a main and backup power supply for fail-safe operation.

The following points should be observed during installation:

- Remove shipping brackets
- All rack equipment should be securely mounted
- Ensure vents are unobstructed to allow cross-flow cooling
- Power supplies are set for correct mains voltage

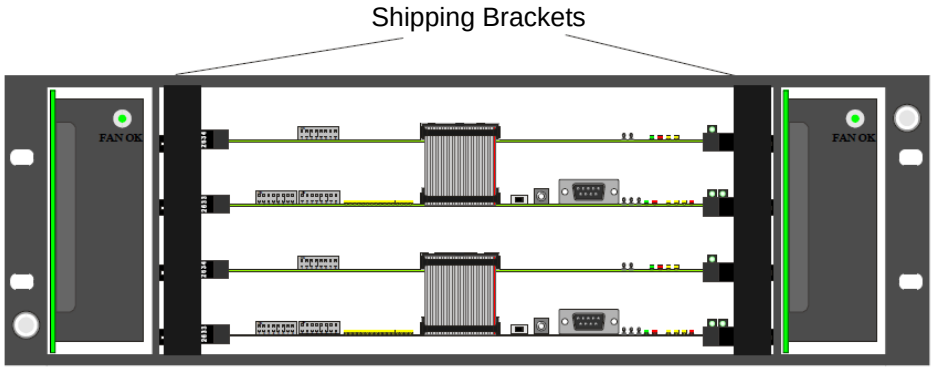


Fig 2. Front View Showing Shipping Brackets

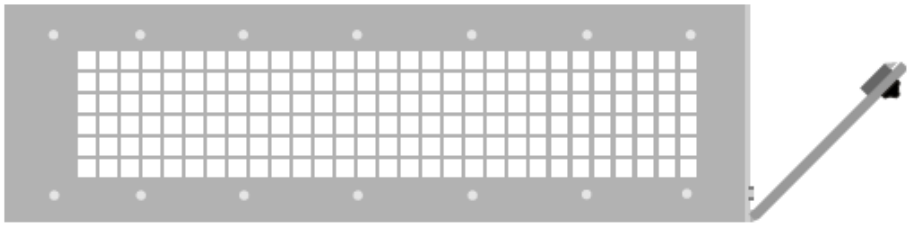


Fig 3. Side View Showing Ventilation Holes

2.1 Installing and Removing Main Cards

Take note of the following when installing and removing cards:

- Each card has a dedicated position in the frame
- Use card ejector handles to ease the task of removal or insertion
- Avoid the use of excessive force, stiffness may indicate rear connector misalignment
- Remember to replace internal expansion card cabling if fitted

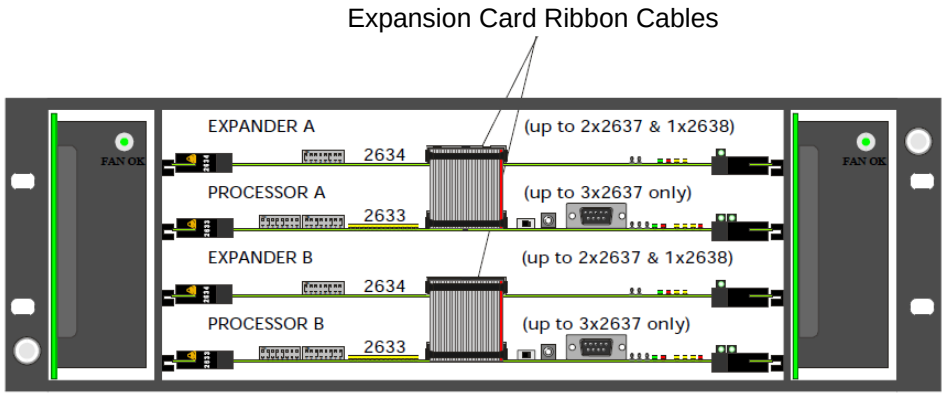


Fig 4. The 6006 Aurora Main Frame Controller Card Positions

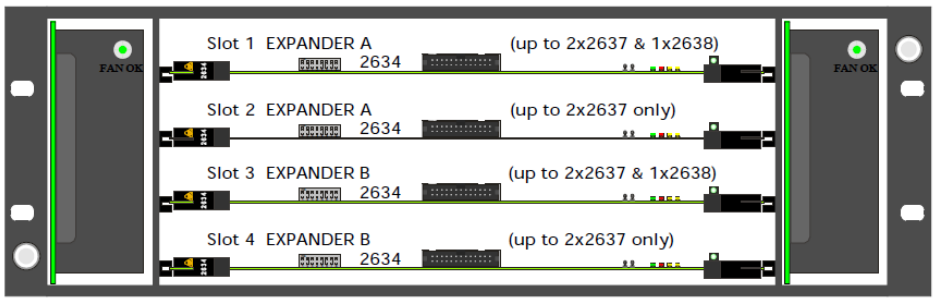


Fig 5. The 6006 Aurora Expansion Frame Card Positions

Note: Expansion frames do not require internal ribbon connectors.

2.2 Installing and Removing Input/Output Modules

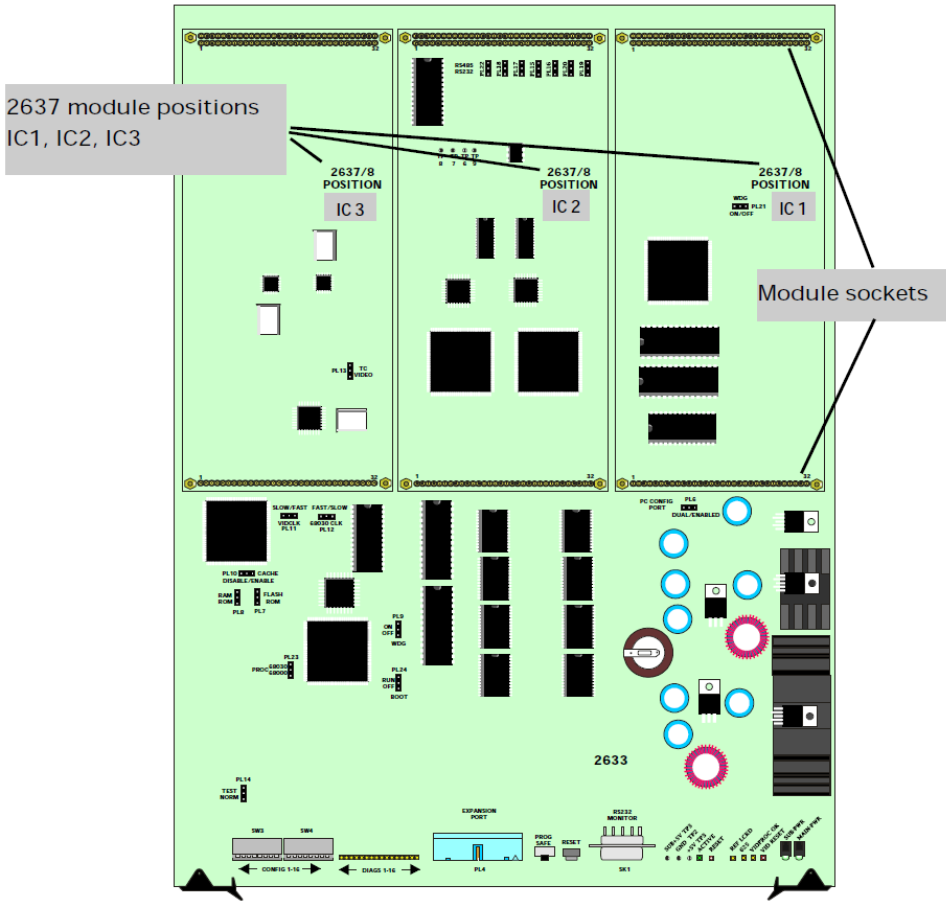


Fig 6. The 2633 Main Processor Showing Option Board Positions

Note: Only 2637 serial I/O sub modules are used on the 2633 processor when used in the Aurora frame.

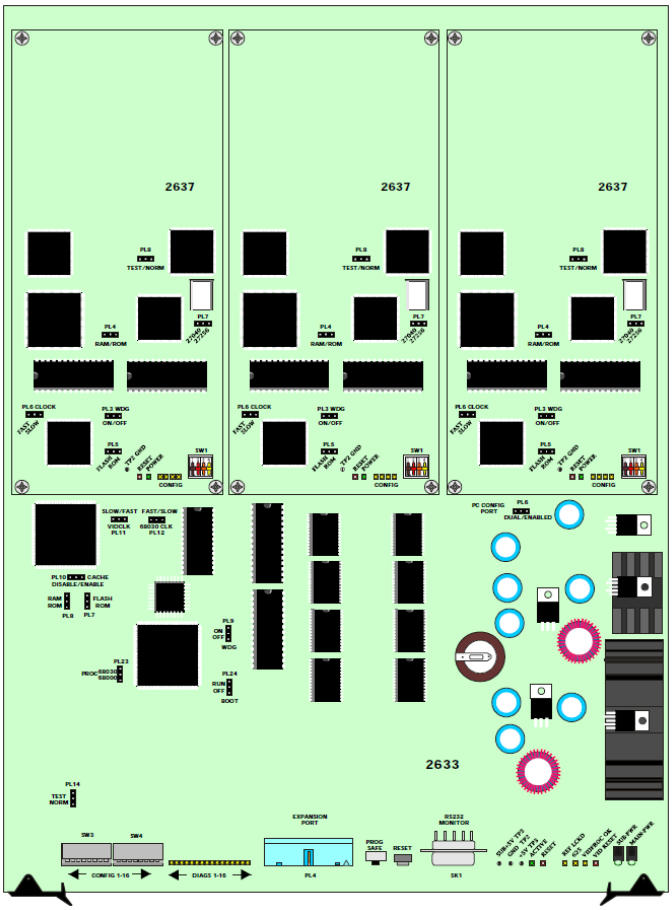


Fig 7. The 2633 Main Processor with Three 2637 Eight Port Serial Modules Fitted

Note: Module orientation (DIL switch nearest board handles) when fitting modules. Each module should be a gentle push-fit into its connectors. Four screws retain each module in position.

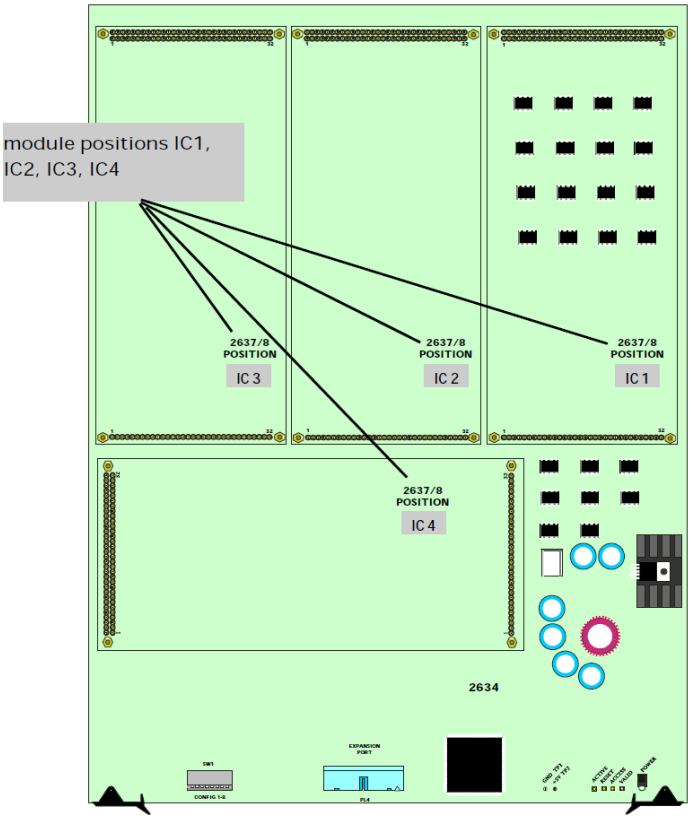


Fig 8. The 2634 Expander Card

The 2634 expansion card has four module positions which can take either 2637 or 2638 sub modules. The modules available for each slot depend on the functions required and the position of the 2634 card when used in an expansion frame. See sections 3.2 and 3.4 for details of modules used when expanding Aurora.

2.3 Expansion Frames

Up to eight Aurora frames fitted with 2634 expander cards, may be cascaded to the main frame and used as expansion frames.

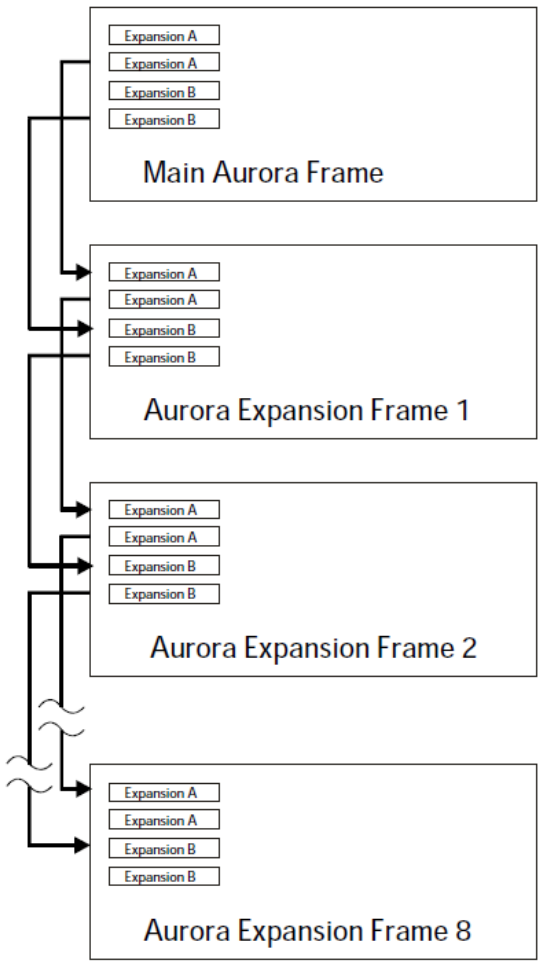


Fig 9. System Expansion with Cascading Expansion Frames

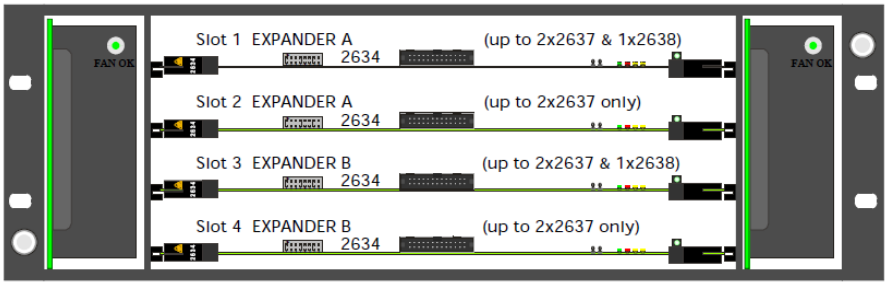


Fig 10. The Aurora Expansion Frame Card Positions

2.3.1 Expander Card Sub Modules

For a single processor system either one or two 2634 expander cards are required for each expansion frame depending upon requirements. A dual processor system can have two or four 2634 expander cards fitted in each expansion frame.

2634 Expansion Sub Modules				
Function	**IC 1**	**IC 2**	**IC 3**	**IC 4**
Main frame internal expansion	2637	2637	2638	Not Used
Expansion frame slot 1 (Exp A)	2637	2637	2638	Not Used
Expansion frame slot 2 (Exp A)	Not Used	Not Used	2637	2637
Expansion frame slot 3 (Exp B)	2637	2637	2638	Not Used
Expansion frame slot 4 (Exp B)	Not Used	Not Used	2637	2637

Table 1. 2634 Expansion Sub Modules

Important: When 2637 sub modules are fitted in positions IC 1 and IC2, they are referred to as module 1 and 2 respectively, however when 2637 modules are fitted in positions IC3 and IC4, they are referred to as module 2 and 1 respectively.

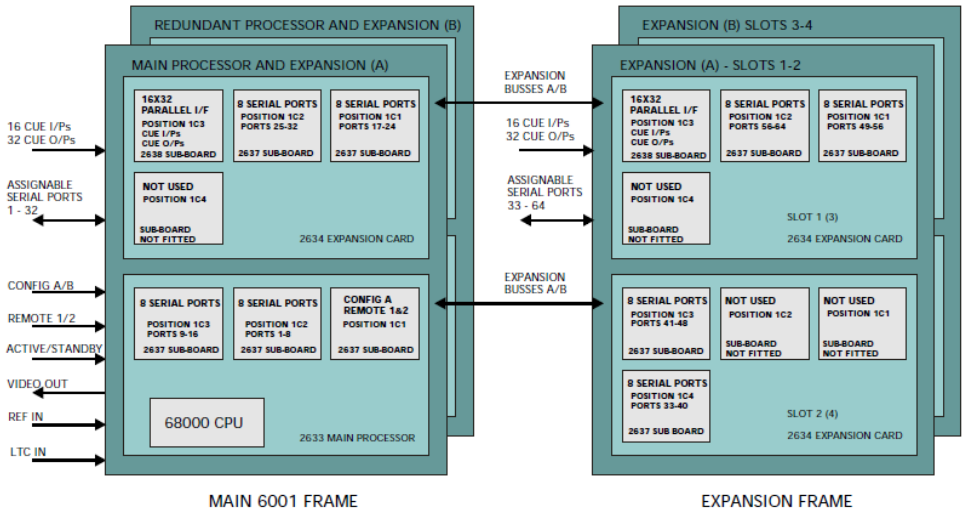


Fig 11. 64 Serial Ports, 32 Cue Inputs and 64 Cue Outputs with One Expansion Frame

Note: Expansion frames are identical to Aurora main frames but with different boards. Only the main frame provides a video output and requires reference and timecode inputs. Please see section 3.2 for 2637 use in expanded systems.

2.4 Rear panel Input/Output Pin-outs

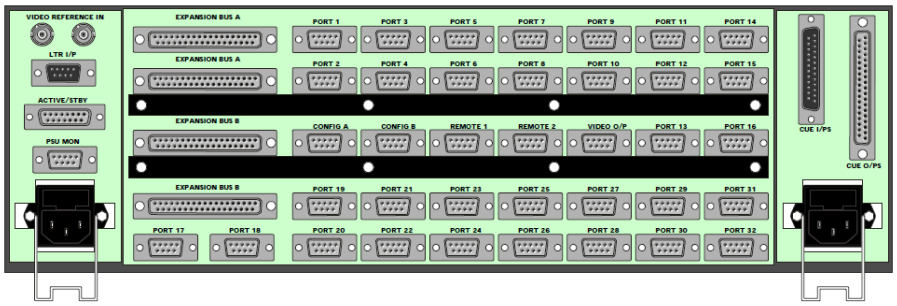


Fig 12. The Aurora Rear Panel Inputs/Output Pin Outs

2.4.1 Serial Data Ports

Matrix/Panel Ports

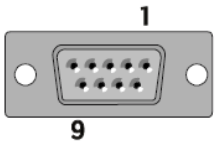
	RS422/RS485 (Ports 1-32)	
	Pin	**Function**
 9 way 'D' type female socket front view	1	Chassis
	2	RX-
	3	TX+
	4	GND
	5	N/C
	6	GND
	7	RX+
	8	TX-
	9	Chassis

Table 2. Matrix/Panel Ports

Remote Control Ports

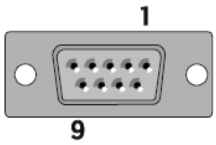
	RS422/RS485 (Ports 1-32)	
	Pin	**Function**
 9 way 'D' type female socket front view	1	Chassis
	2	TX-
	3	RX+
	4	GND
	5	N/C
	6	GND
	7	TX+
	8	RX-
	9	Chassis

Table 3. Remote Control Ports

Config A/B

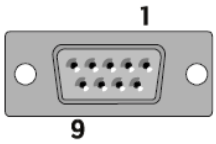
	Config A/B *See following note		
	Pin	RS485 Function	RS232 Function
 9 way ‘D’ type female socket front view	1	Chassis	Chassis
	2	TX-	TX
	3	RX+	RX
	4	Chassis	Chassis
	5	N/C	N/C
	6	Chassis	Chassis
	7	TX+	N/C
	8	RX-	N/C
	9	Chassis	Chassis

Table 4. Config A/B*

Note: *See section 3.5 for setting the configuration port mode to either RS485 or RS232

Remote Ports 1 & 2

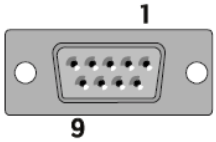
	Remote Ports 1 & 2	
	Pin	Function
 9 way ‘D’ type female socket front view	1	Chassis
	2	TX-
	3	RX+
	4	GND
	5	N/C
	6	GND
	7	TX+
	8	RX-
	9	Chassis

Table 5. Remote Ports 1 & 2

PSU Mon

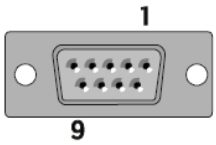
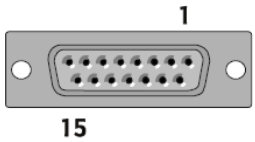
	PSU Mon	
	Pin	Function
 9 way ‘D’ type female socket front view	1	Chassis
	2	Relay 1 Common
	3	Relay 1 S/C
	4	Relay 1 O/C
	5	Relay 2 Common
	6	Relay 2 S/C
	7	Relay 2 O/C
	8	N/C
	9	N/C

Table 6. PSU Mon

Active/Standby



15 way ‘D’ type female socket front view

Active/Standby		
Pin	**Function**	**Specification**
1	SET ACTIVE A	Active Low Input
2	SET IDLE A	Active Low Input
3	ACTIVE A	Logic Output
4	IDLE A	Logic Output
5	FAIL A	Logic Output
6	SET ACTIVE B	Active Low Input
7	SET IDLE B	Active Low Input
8	ACTIVE B	Logic Output
9	IDLE B	Logic Output
10	FAIL B	Logic Output
11	N/C	
12	N/C	
13	+5V LED Supply	500 mA max current
14	GND	

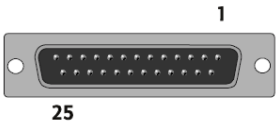
Table 7. Active/Standby

Note:

- Active low inputs to be taken to 0V for correct operation.
- Logic outputs are capable of sinking 3mA

2.4.1.1 Cue Inputs/Outputs

Cue Inputs



25 way ‘D’ type male plug front view

Cue Inputs 1 - 16	
Pin	**Function**
1	IN1
2	IN2
3	IN3
4	IN4
5	IN5
6	IN6
7	IN7
8	IN8
9	IN9
10	IN10
11	IN11
12	IN12
13	IN13
14	IN14
15	IN15
16	IN16
17	N/C
18	N/C
19	N/C
20	N/C
21	N/C
22	N/C
23	Supply Inputs 1 - 8
24	Supply Inputs 9 - 16
25	Chassis

Table 8. Cue Inputs

Note: Supply inputs may range from +5V to +15V. Current rating 0.5mA.

Cue Outputs

37 way ‘D’ type female socket front view

	Cue Outputs 1 - 32			
	Pin	Function	Pin	Function
	1	Out 1	20	Out 20
	2	Out 2	21	Out 21
	3	Out 3	22	Out 22
	4	Out 4	23	Out 23
	5	Out 5	24	Out 24
	6	Out 6	25	Out 25
	7	Out 7	26	Out 26
	8	Out 8	27	Out 27
	9	Out 9	28	Out 28
	10	Out 10	29	Out 29
	11	Out 11	30	Out 30
	12	Out 12	31	Out 31
	13	Out 13	32	Out 32
	14	Out 14	33	N/C
	15	Out 15	34	N/C
	16	Out 16	35	N/C
	17	Out 17	36	N/C
	18	Out 18	37	Chassis
	19	Out 19		

Table 9. Cue Outputs

Note:

- Cue outputs are open collector drivers and are all active low. They will accept between +5V to +24V and will sink up to 40mA.
- While configuration switches 4 to 9 and 11 to 12 (SW3: 4 to SW3: 8, SW4: 1 and SW4:3 to SW4: 4) are not used they must be set to the UP position for correct system operation.

2.4.2 Expansion Busses

Upper (A) Main and Expansion Busses

37 way ‘D’ type female socket front view

Upper (A) Main and Expansion Busses			
Pin	Function	Pin	Function
1	RST +A	20	RST -A
2	IO +A	21	IO -A
3	SB +A	22	SB -A
4	FLG0 +A	23	FLG0 -A
5	FLG1 +A	24	FLG1 -A
6	FLG2 +A	25	FLG2 -A
7	ACC +A	26	ACC -A
8	EB0 +A	27	EB0 -A
9	EB1 +A	28	EB1 -A
10	EB2 +A	29	EB2 -A
11	EB3 +A	30	EB3 -A
12	EB4 +A	31	EB4 -A
13	EB5 +A	32	EB5 -A
14	EB6 +A	33	EB6 -A
15	EB7 +A	34	EB7 -A
16	EB8 +A	35	EB8 -A
17	N/C	36	N/C
18	N/C	37	Chassis
19	N/C		

Table 10. Upper (A) Main and Expansion Busses

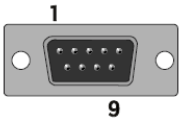
Upper (B) Main and Expansion Busses

37 way ‘D’ type female socket front view

Upper (B) Main and Expansion Busses			
Pin	Function	Pin	Function
1	RST +B	20	RST -B
2	IO +B	21	IO -B
3	SB +B	22	SB -B
4	FLG0 +B	23	FLG0 -B
5	FLG1 +B	24	FLG1 -B
6	FLG2 +B	25	FLG2 -B
7	ACC +B	26	ACC -B
8	EB0 +B	27	EB0 -B
9	EB1 +B	28	EB1 -B
10	EB2 +B	29	EB2 -B
11	EB3 +B	30	EB3 -B
12	EB4 +B	31	EB4 -B
13	EB5 +B	32	EB5 -B
14	EB6 +B	33	EB6 -B
15	EB7 +B	34	EB7 -B
16	EB8 +B	35	EB8 -B
17	N/C	36	N/C
18	N/C	37	Chassis
19	N/C		

Table 11. Upper (B) Main and Expansion Busses

2.4.3 Timecode



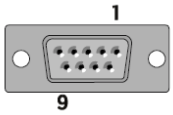
9 way ‘D’ type male plug front view

LTC Input	
Pin	Function
1	LTC IN +
2	N/C
3	N/C
4	N/C
5	N/C
6	LTC IN -
7	Chassis
8	Chassis
9	Chassis

Table 12. Timecode LTC Input

2.4.4 Video Output

(Presented as a Monochrome Signal)



9 way ‘D’ type female socket front view

Video Output	
Pin	**Function**
1	RED
2	N/C
3	BLUE
4	N/C
5	N/C
6	GREEN (Mono)
7	N/C
8	Sync
9	Chassis

Table 13. Video Output

3. Hardware Configuration

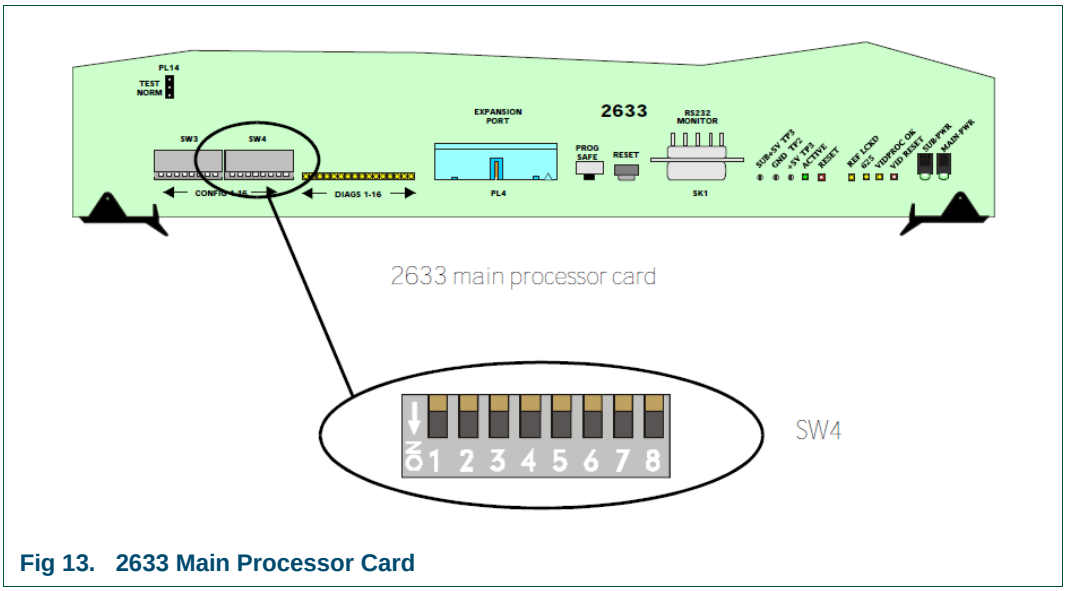


Fig 13. 2633 Main Processor Card

3.1 Setting the Database Format

The Aurora controller supports both Aurora and System 3 database formats. The format used is dependent on which options have been enabled during database configuration. Switches SW3-1 and SW3-2 set the database format.

Database Format Config Settings SW3: 1 & 2		Function
1	2	
UP	UP	SYSTEM3 format (DB303.01)
DOWN	UP	AURORA format (AUR01.00)
UP	DOWN	Reserved for future use
DOWN	DOWN	AURORA format (AUR01.01)

Table 14. Setting the Database Format

3.2 Timecode Display on Status Display

Timecode Display on Status Display	
Config Position 3 (SW3: 3)	Function
UP	Timecode displayed on status display
DOWN	Timecode not displayed on status display

Table 15. Timecode Display on Status Display

3.3 Enable/Disable Initial Router Tally Broadcast

Note: The Enable/Disable Initial Router Tally Broadcast feature is available with firmware version 1.24 and later.

Normally as Aurora does its background read of router tallies, if any are different, the new status is broadcast to all the remote ports. On power-up, Aurora is reading one destination's crosspoint status every 20 ms, which means a command broadcast will be broadcast every 20 ms through each of the remote ports. The external devices connected to the remote ports need to be able to process these commands at this rate (or faster).

If any of the remote devices cannot keep up with this rate, the internal buffers will start to fill up and will block ports from getting responses to new commands until the backlog is cleared. Once any of the buffers fill up, the commands will only empty at the rate the slowest external device processes the commands.

To help get over this initial burst of data, the ability to disable the initial power-up broadcast of crosspoint status has been added. This is configured using DIL switch 10 on the 2633 module.

Enable/Disable Initial Router Tally Broadcast	
Config Position 10 (SW4: 2)	**Function**
UP	Initial Broadcast of router tallies is enabled
DOWN	Initial Broadcast of router tallies is disabled

Table 16. Enable/Disable Initial Router Tally Broadcast

Note:

- If the external devices do not have some sort of background refresh of crosspoint status, there is a possibility that the external devices tallies could be out of sync with the Aurora crosspoint tallies if the initial broadcast is disabled.
- If during the initial poll of the routers by Aurora, there is no response to a tally request for whatever reason, the initial poll state for the destinations on that router port is cancelled which will cause the tallies to be broadcast to all remote ports when the connection to that router section is re-established.

3.4 Setting the Status Display Standard

Status Display Standard	
Config position 16 (SW4: 8)	**Function**
DOWN	525 lines mode
UP	625 lines mode

Table 17. Setting the Status display Standard

Note: The editor screen status display mode must agree with this switch setting.

3.5 Configuration Switches 4 to 12

While configuration switches 4 to 9 and 11 to 12 (SW3: 4 to SW3: 8, SW4: 1 and SW4: 3 to SW4: 4) are not used they must be set to the UP position for correct system operation.

3.6 Assigning Serial Ports

The 2637 serial port card can be used to provide Matrix, Device and Remote ports when used on the 2633 main processor and 2634 expansion cards.

The configuration details are as follows:

Using the 2637card In the Main Frame

Assigning the 2637 Sub-Module Serial Ports							
2633 Processor Config Settings (SW4: 5, 6, 7)			2637 position on 2633 Processor			2637 position on 2634 Expansion	
13	14	15	IC 1 Config A/B* Remote 1/2	IC 2 Ports 1-8 Device	IC 3 Ports 9-16 Assignable	IC 1 Ports 17-24 Assignable	IC 2 Ports 25-32 Assignable
UP	UP	UP	Remote 1/2	Device	Matrix	Device	Matrix
DOWN	UP	UP	Remote 1/2	Device	Device	Matrix	Matrix
UP	DOWN	UP	Remote 1/2	Device	Matrix	Matrix	Matrix
DOWN	DOWN	UP	Remote 1/2	Device	Device	Device	Matrix
UP	UP	DOWN	Remote 1/2	Device	Matrix	Remote	Matrix
DOWN	UP	DOWN	Remote 1/2	Device	Matrix	Device	Remote
UP	DOWN	DOWN	Remote 1/2	Device	Matrix	Remote	Remote

Table 18. Using the 2637card In the Main Frame

Note:

- The first port of the main processor IC1 sub module is wired to the ‘Config A’ port, whilst the first port of the redundant processor IC1 sub-module is wired to the ‘Config B’ port. The remaining ports are wired to the sub-modules of main and redundant systems in parallel.
- The configuration switches 1 - 8 on the 2634 expansion card when fitted in the main frame are not used and MUST be set to the DOWN position.

Using the 2637 in Expansion Frames

Aurora can have up to 8 expansion frames. For a single processor system, either one or two 2634s are required, depending on port requirements. A dual processor system can have two or four 2634 expander cards.

The 2634 card has 8 DIL switches on the front, used to configure the base address of the card, the bus termination and the orientation of the 2637 sub modules base address. Each 2637 can run in one of the three modes, Matrix mode, Remote control mode and Panel/Device mode. The mode of operation is determined by the switch setting on the 2634 card and the position of the 2637 card on the 2634 card, as defined on the table below.

Using the 2637 Sub-Modules in Expansion Frames

Switch Number Switches 1 to 5					Use Sub-Module Mode	
1	**2**	**3**	**4**	**5**	**Sub-Module 1**	**Sub-Module 2**
DOWN	DOWN	DOWN	DOWN	DOWN	Local 2634, see 2633 DIL switch Table 18.	
UP	DOWN	DOWN	DOWN	DOWN	Device	Device
DOWN	UP	DOWN	DOWN	DOWN	Device	Device
UP	UP	DOWN	DOWN	DOWN	Device	Device
DOWN	DOWN	UP	DOWN	DOWN	Device	Device
UP	DOWN	UP	DOWN	DOWN	Matrix	Matrix
DOWN	UP	UP	DOWN	DOWN	Matrix	Matrix
UP	UP	UP	DOWN	DOWN	Matrix	Matrix
DOWN	DOWN	DOWN	UP	DOWN	Matrix	Matrix
UP	DOWN	DOWN	UP	DOWN	Matrix	Matrix
DOWN	UP	DOWN	UP	DOWN	Matrix	Matrix
UP	UP	DOWN	UP	DOWN	Matrix	Matrix
DOWN	DOWN	UP	UP	DOWN	Matrix	Matrix
UP	DOWN	UP	UP	DOWN	Remote	Remote
DOWN	UP	UP	UP	DOWN	Device	Matrix
UP	UP	UP	UP	DOWN	Device	Remote
DOWN	DOWN	DOWN	DOWN	UP	Remote	Matrix
Switch 6					Not Used	
Switch 7					UP for any 2634 occupying a 2633 slot (slots 2 and 4) DOWN for any 2634 occupying a 2634 slot (slots 1 and 3)	
Switch 8					UP - Terminate the BUS. PLEASE NOTE - For an expanded System, one of the 2634's in the last frame should have this switch UP. If a backup system is used, then one 2634 in each system should have this switch on.	

Table 19. Using the 2637 Sub-Modules in Expansion Frames

Note: Switch 7 on the 2634 must be UP to let the hardware know that this 2634 occupies a 2633 position, otherwise the software will not find the sub modules. This is because of the manner in which the ports physically map to the connectors on the backplane.

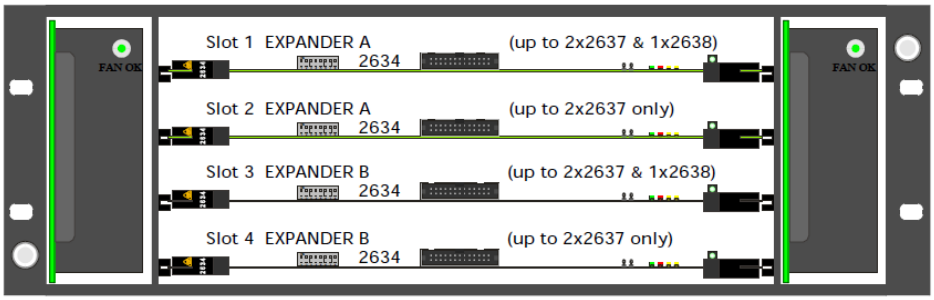


Fig 14. Using the 2634 Expander Card in Expansion Frames

Note: If a 2634 card in an expansion frame occupies slots 2 or 4, the slots that a 2633 controller card normally occupies, then the sub modules must be in positions IC4 and IC3 for sub module 1 and 2 respectively. If the 2634 card is used in slots 1 or 3 of an expansion frame, then the 2637 sub module must occupy IC1 and IC2 respectively.

3.7 Using Parallel Ports

The 2638 module is an intelligent parallel I/O card with 16 optically isolated inputs and 32 collector driver outputs. It is used to interface GPI triggers and other parallel data to external equipment.

The 2638 sub module may only be used on the 2634 expander card in position IC3. However, there are rules defining the deployment of the card in expanded systems. Please see section 2.3, for details of 2638 sub module when used in Aurora expansion.

3.8 Changing Main Processor Board Options

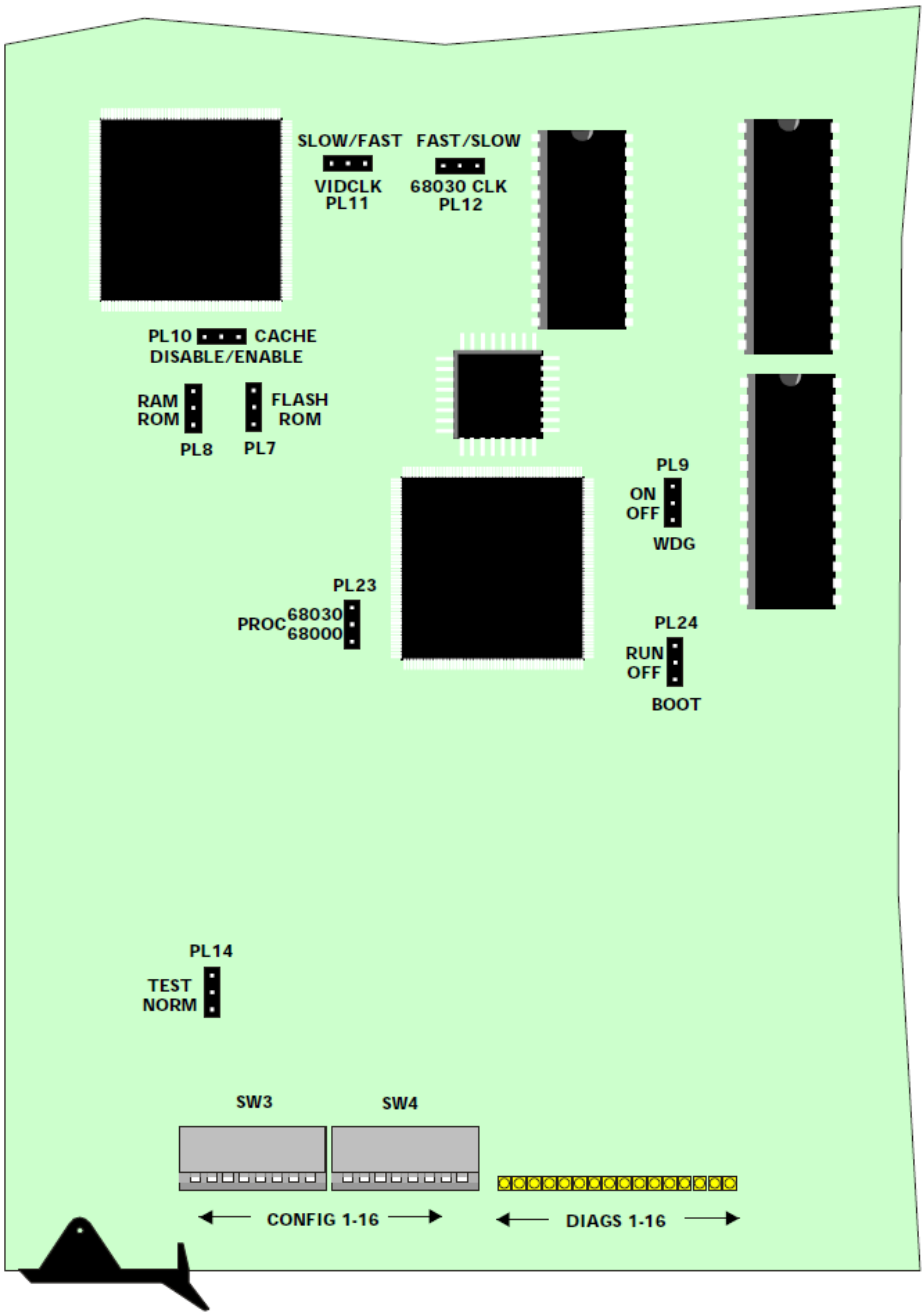


Fig 15. The 2633 Main Processor Card CPU and Video Option Jumpers

Setting CPU and Video Processor Options

Processor Options			
Jumper	**Function**	**Position**	**Default**
PL7	FLASH/ROM	FLASH ROM	ROM
PL8	RAM/ROM	RAM ROM	ROM
PL10	CACHE	DISABLE ENABLE	ENABLE
PL11	VIDCLK	SLOW FAST	FAST
PL 12	68030 CLK	FAST SLOW	FAST
PL14	TEST	NORM TEST	NORM
PL23	CPU SELECT	68030 68000	68030
PL24	BOOT	RUN OFF	RUN

Table 20. Setting CPU and Video Processor Options

Setting Watchdog Options

Watchdog Settings			
Jumper	**Function**	**Position**	**Default**
PL9	WATCHDOG	ON OFF	ON
PL21	WATCHDOG	ON OFF	ON

Table 21. Setting Watchdog Options

Setting the PC CONFIG A/B modes

The controller may be configured from a PC by using the CONFIG A and CONFIG B ports at the rear of the frame. These ports are provided by port 1 of the first 2637 sub module of the main and redundant 2633 processor cards.

The serial mode of these ports may be changed between RS232 and RS485 by changing jumpers on the 2633 card as explained below:

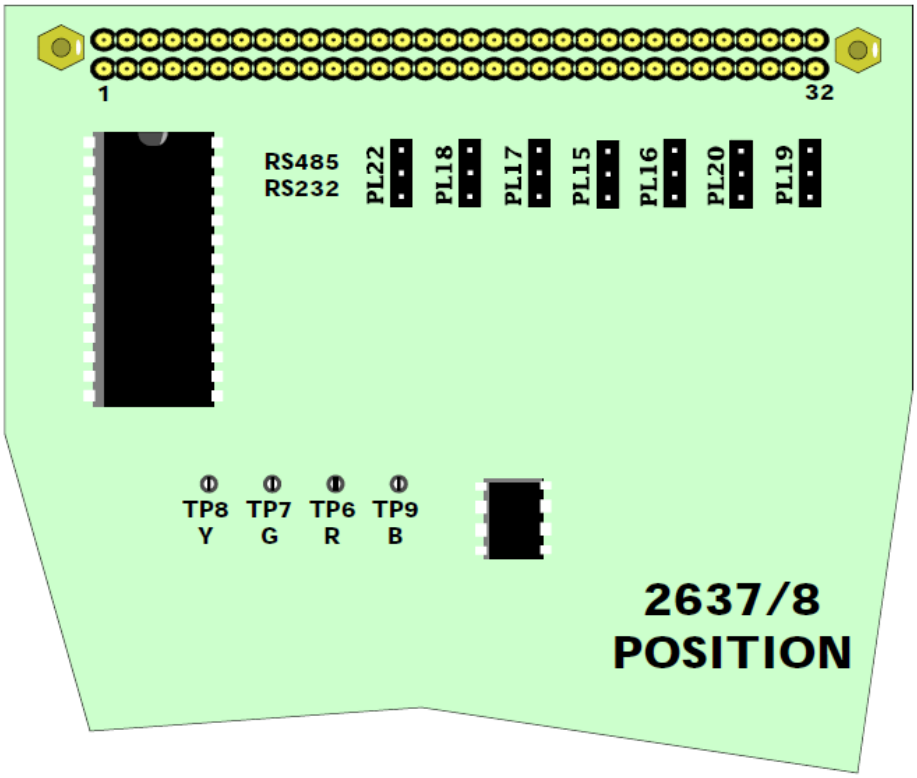


Fig 16. Port 1 Jumpers Under Central I/O Module on 2633 Card

Config Port Mode Setting on Main Processor			
Jumper	**Function**	**Position**	**Default**
PL15, 16, 17, 18, 19, 20 and 22	Port Mode Change	RS485 RS232	RS232

Table 22. Config Port Mode Setting on Main Processor

Note: All seven jumpers, PL 15, 16, 17, 18, 19, 20 and 22, on the 2633 processor located under the central 2637 I/O module, must be repositioned to change the serial mode of port 1 of the first sub-module on the main and redundant processors.

Database Downloads

It is possible to download a database from an editor PC to either active or idle processors separately or just to the active processor.

This is controlled by PL6 on the 2633 processor card. In addition SW2 on the front of the 2633 main processor, is provided to allow or prevent changes to the database.

Database Write Options			
Control	**Function**	**Position**	**Default**
PROG/SAFE SW 2	Write protects database	PROG SAFE	SAFE
PL 6	RS485 Inhibit	Dual Enabled	Enabled

Table 23. Database Write Options

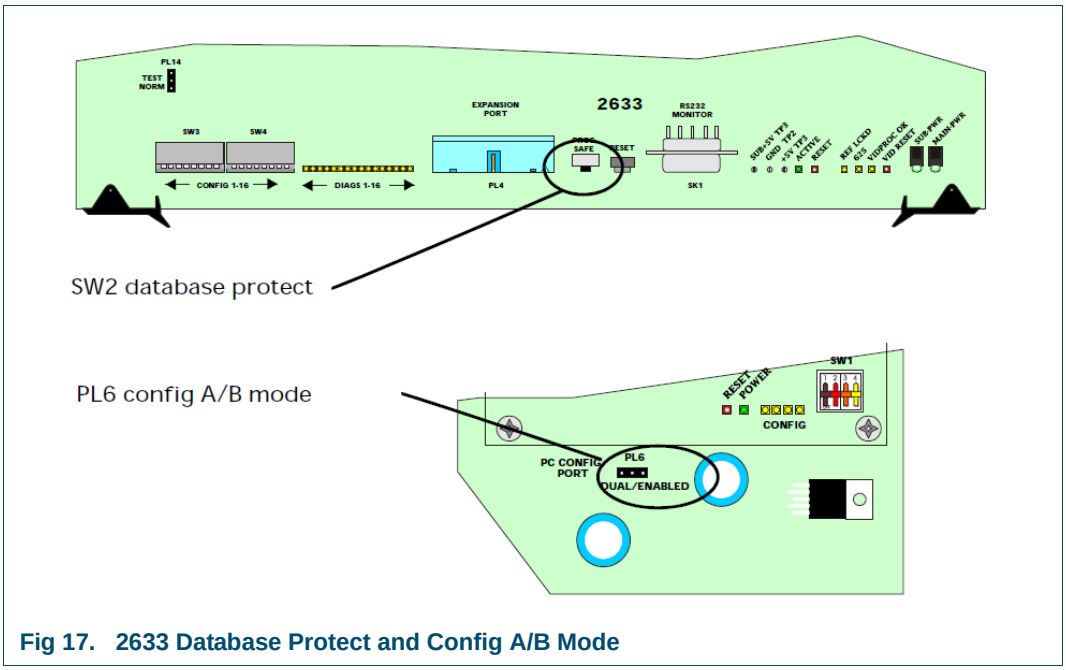


Fig 17. 2633 Database Protect and Config A/B Mode

PL 6 Jumper Position	Function	Operation
ENABLED (default)	Both config ports are active and independent, irrespective of the active processor	Allows the idle processor to be updated independent of the active processor. Once updates are complete the idle controller can be switched to active.
DUAL	ACTIVE processor port is active - IDLE processor port is not active	Updates are downloaded to active processor. **NOTE**: Downloading a database to an active processor will stop the active processor operating until the download is complete

Table 24. PL 6 Jumper Position

Note: It is recommended that only the ENABLED mode is used

3.9 Configuring 2638 Options

The 2638 interface provides 32 open collector output lines and 16 optically isolated input lines. It can occupy position IC3 of a 2634 expander card in a main frame and the IC3 position of a 2634 card when used in slot 2 or 4 of an expansion frame.

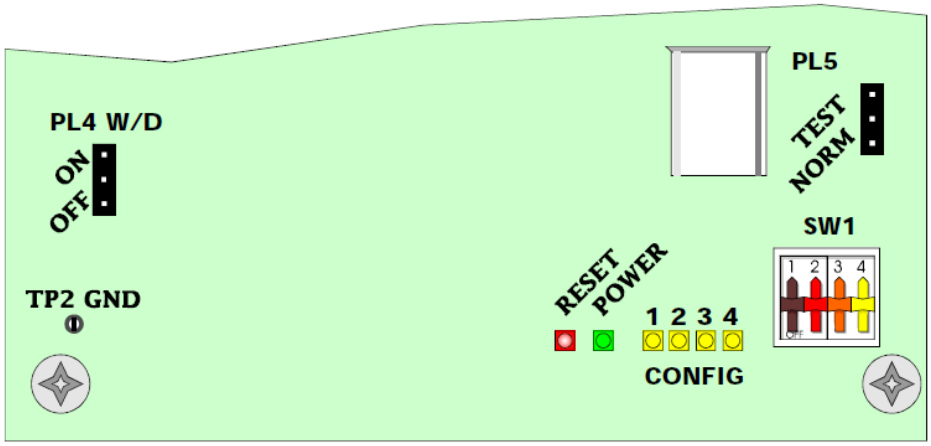


Fig 18. Configuring 2638 Options

Setting the Default Output Pulse Length

SW1 configuration **OFF = lever down** (nearest bottom card edge)		
Default Pulse Duration	**SW1**	**SW2**
10 milliseconds	0	0
100 milliseconds	0	1
Video Frames	1	0
Reserved	1	1

Table 25. Setting the Default Output Pulse Length

SW3 and SW4 are not currently used but should be off for compatibility with future releases of the software.

The default pulse duration value may be overridden by software.

Enabling the Watchdog

Watchdog - PL4	
Function	**Position**
Watchdog Enabled	ON (Default)
Watchdog Disabled	OFF

Table 26. Enabling the Watchdog

Setting the Processor Mode

Processor Mode- PL5	
Function	**Position**
Norm	Norm (Default)
Test	For test purposes only

Table 27. Setting the Processor Mode

3.10 Configuring 2637 Options

The 2637 sub module provides eight serial ports which can be configured according to the mode of operation selected by the host processor. These normal modes of operation include the multi-drop device interface, the router control or matrix interface and the remote control interface. A flash EPROM mode is also available for programming the on-board RAM. In addition several factory test modes exist for Snell engineers to test card functionality.

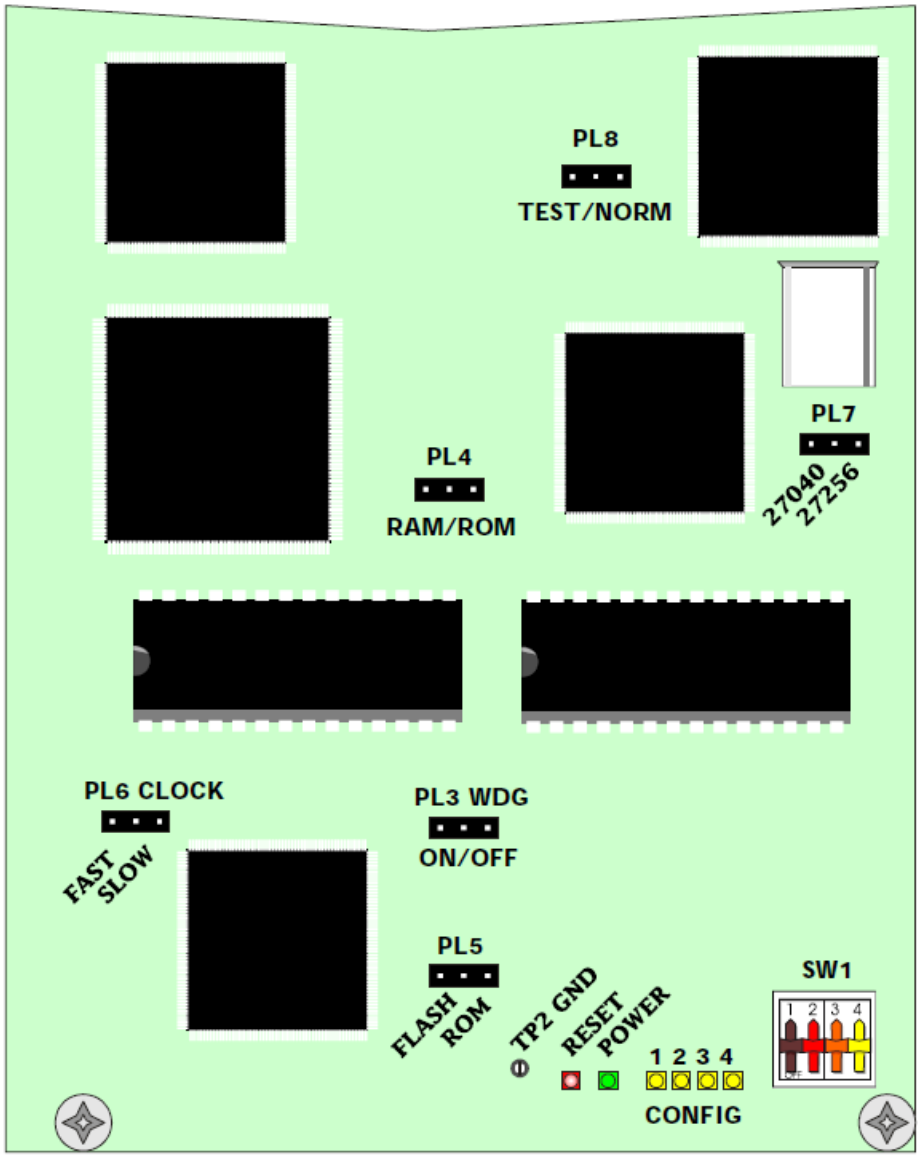


Fig 19. Configuring 2637 Options

On power up all ports will be disabled until the host processor initializes and configures the mode of operation for the ports. However, port hardware set up can be determined by DIL switch SW1 in addition to the PC configuration jumpers (see Table 28. on page 36) for the first port (CONFIG A/B) of the first 2637 card on the main and backup 2633 processor cards.

Configuring Port Hardware Settings

Switch SW1 Settings						
	Multi-drop Device		Router (Matrix) Control		Remote Control	
	OFF	ON	OFF	ON	OFF	ON
SW1-1	4 Wire Circuit	2 Wire Circuit	38.4 kBaud for Port 1	9.6 kBaud for Port 1	38.4 kBaud for Port 1	19.2 kBaud for Port 1
SW1-2	Not Used	Not Used	38.4 kBaud for Port 2	9.6 kBaud for Port 2	38.4 kBaud for Port 2	19.2 kBaud for Port 2
SW1-3	38.4 kBaud for Ports 1-4	9.6 kBaud for Ports 1-4	38.4 kBaud for Port 3	9.6 kBaud for Port 3	38.4 kBaud for Port 3	19.2 kBaud for Port 3
SW1-4	38.4 kBaud for Ports 5-8	9.6 kBaud for Ports 5-8	38.4 kBaud for Port 4	9.6 kBaud for Port 4	38.4 kBaud for Port 4	19.2 kBaud for Port 4

Table 28. Configuring Port Hardware Settings

Default settings irrespective of board function is all OFF.

Setting Card Defaults

The following table lists the default settings for system jumpers located on the sub module:

2637 Processor Options			
Mode	Jumper	Function	Default
Norm Test	PL8	Factory Test	Norm
RAM ROM	PL4	RAM/ROM Selection	ROM
27040 27256	PL7	Device Selection	27040
FAST SLOW	PL6 CLK	CPU Clock Selection	FAST
FLASH ROM	PL5	Device Selection	ROM
ON OFF	PL3	Watchdog	ON

Table 29. Setting Card Defaults

4. Status Monitoring

4.1 Checking Processor Board Operation

The 2633 processor card has 16 software programmable diagnostic LEDs which indicate system modes, hardware/software errors and diagnostic information.

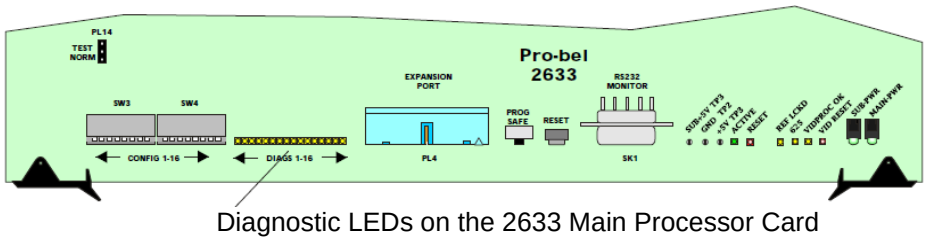


Fig 20. Diagnostic LEDs on the 2633 Main Processor Card

Reading Diagnostic Indicators

System Diagnostic Indicators		
LED	**Indication**	**Meaning**
9	ON	No response to tally request on matrix ports 1 - 8
10	ON	No response to tally request on matrix ports 9 -16
9 & 10	BOTH ON	No response to tally request on matrix ports 17 and above
11	ON	Unable to TX data to a control device on port 1 - 8
12	ON	Unable to TX data to a control device on port 9 - 16
11 & 12	BOTH ON	Unable to TX data to a control device on port 17 and above
13	ON	Destination is not assigned to a matrix port
14	ON	General fault - an internal buffer is full or some unexpected data has been detected
15	FLASHING	Data being transferred successfully between ACTIVE and IDLE processors. This will only be flashing on the ACTIVE processor, It will be OFF on the IDLE processor
16	ON	External timecode is present

Table 30. Diagnostic Indicators

Confirming System Modes

System LEDs 1 to 4		
LED	**Indication**	**Mode**
1 & 2	Flashing Alternately	System running in ACTIVE mode
1 & 2	Flashing Together	System running in IDLE mode
3	ON OFF	Invalid or corrupt system database System database is OK
4	Flashing	Downloading database from PC

Table 31. Confirming System Modes

Checking Hardware and Software Errors

LEDs 5-8 indicate hardware and software errors. Normally all 4 LEDs should be OFF indicating normal system operation.

Internal Hardware/Software Errors				
LED Number				LED Function
5	6	7	8	
OFF	OFF	OFF	OFF	No error - normal system state
OFF	ON	OFF	OFF	Bus error
ON	ON	OFF	OFF	Address error
OFF	OFF	ON	OFF	Illegal instruction error
ON	OFF	ON	OFF	Divide by zero error
OFF	ON	ON	OFF	CHK instruction error
ON	ON	ON	OFF	TRAPV instruction error
OFF	OFF	OFF	ON	Privilege violation error
ON	OFF	OFF	ON	Trace error
OFF	ON	OFF	ON	Unexpected interrupt error
ON	ON	OFF	ON	Spurious interrupt error
OFF	OFF	ON	ON	Un-initialized interrupt error

Table 32. Checking Hardware and Software Errors

Checking Basic Functions

The 2633 processor and 2634 expansion cards have the following LEDs and test points provided to allow monitoring of basic functions such as power, reference lock, and operational status. Some indicators are specific to each card.

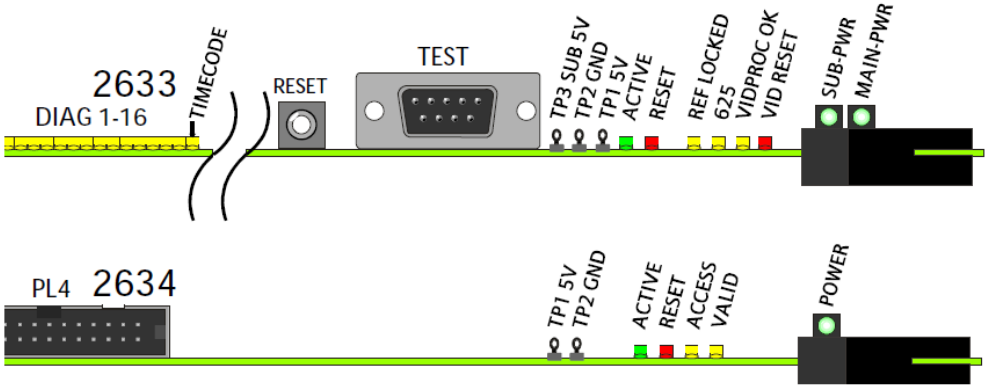


Fig 21. 2633 & 2634 Card LEDs

Checking Basic Functions

LED	Indication	Board	Function
ACTIVE	Green	2633/2634	Lights to indicate that the board is in the active condition in a dual processor configuration
RESET	Red	2633/2634	Lights to indicate that the system is in a reset condition
REF LCKD	Yellow	2633	Lights to indicate reference lock
625	Yellow	2633	Lights for 625, off for 525 reference
VIDPROC OK	Yellow	2633	Flashes to indicate that the video processor is OK
VID RESET	Red	2633	Lights to indicate that the video processor is in a reset condition (LED located behind right board handle)
ACCESS	Yellow	2634	Monitors ACCESS line
VALID	Yellow	2634	Monitors VALID line
SUB PWR	Green	2633	Monitors Sub +5V rail (test point available)
MAIN PWR	Green	2633	Monitors +5V rail (test point available)
POWER	Green	2634	Monitors +5V rail (test point available)
TIMECODE	Yellow (DIAG16)	2633	Lights to indicate timecode present

Table 33. 2633 & 2634 LEDs

The 9 way ‘D’ connector, SK1 on the 2633 card is for use by Snell engineers to update the flash-rom.

4.2 Checking 2638 Module Operation

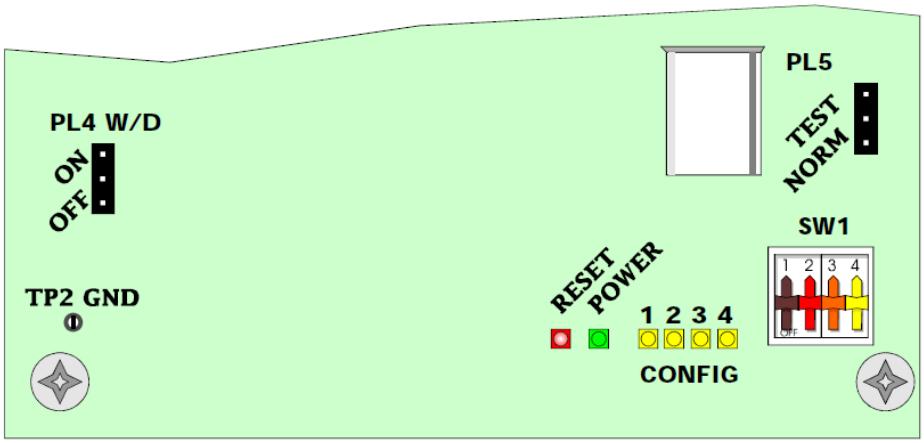


Fig 22. 2638 Card LEDs

Reading Diagnostic LEDs

Diagnostic LEDs	Normal Operation	
LED	**Indication**	**Function**
Config 1	Yellow Flashing	Module running, flash rate indicates mode:-
Idle Mode	1 Hz	Idle mode - host 2634 is backup in dual processor system
Active Mode	2 Hz	Active and scanning Dual Port RAM
Active Mode	4 Hz	Active but not scanning Dual Port RAM
Config 2	Yellow Flashing	Input data changes detected
Config 3	Yellow Flashing	Output data changes detected
Config 4	Yellow Flashing	Flashes at 1/10 input scan rate
PWR	Green On	+5V power OK

Table 34. 2638 LEDs

The Dual Port RAM on the 2638 is used by the host processor to buffer parallel data either being read from the 2638 inputs or written to its outputs.

4.3 Checking 2637 operation

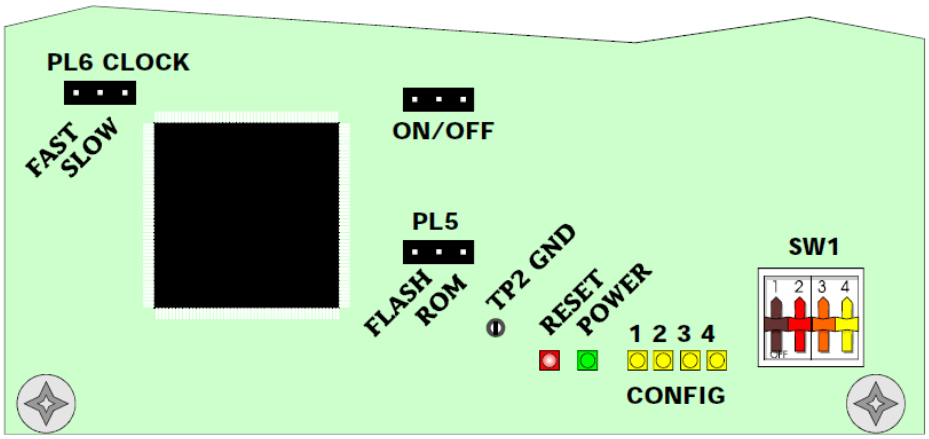


Fig 23. 2637 Card LEDs

Reading Diagnostic LEDs

Diagnostic LEDs	Normal Operation	
LED	Indication	Function
Config 1	Yellow Flashing	Flashes to indicate processor running:- 10Hz = running, not configured 5Hz = running, serial I/O disabled 2Hz = running, multi-drop device mode 1Hz = running, router control mode 0.5Hz = running, remote control mode/flash loader mode
Config 2	Yellow On	Fault indicator:- Erroneous data, internal buffers full up
Config 3	Yellow On	Lights if valid Rx messages received on any serial port
Config 4	Yellow On	Lights if any Tx data transmitted on any serial port
PWR	Green On	+5V power OK
RST	Red On	Indicates processor reset

Table 35. 2637 LEDs

5. Specification

Main Features

- Up to 32 assignable RS485 serial ports, 16 cue inputs and 32 cue outputs in the main frame
- Serial ports may be flexibly assigned to matrix, panel, and remote control devices
- Main and backup controller boards with controller expansion option
- Component analogue video output for status display
- Active/standby control
- Timecode lock
- Two dedicated configuration and remote ports
- Multi-standard reference loop through input
- External power supply monitoring port
- Status monitoring on each module

Expansion Capability

- Support for three 8 port serial cards on each controller card
- Support for two 8 port serial cards on each controller expansion card
- Support for 16 cue inputs and 32 cue outputs per main frame controller expansion card
- Expansion ports to cascade up to eight Aurora expansion frames
- Each expander card in an expansion frame can support up to sixteen serial ports
- Each expansion frame can support an additional 16 cue inputs and 32 cue outputs
- A fully expanded system with one main frame and 8 expansion frames can support up to 288 assignable serial ports, 144 cue inputs and 288 cue outputs

Connectors

(see section 2.4 for pin-outs)

- RS422/RS485/RS232: 9 way ‘D’ type sockets
- Cue inputs: 25 way ‘D’ type socket, 16 active low inputs with a separate supply input of +5V to +15V at 0.5 mA
- Cue outputs: 37 way ‘D’ type socket, 32 active low collector driver outputs, each capable of accepting between +5V to +24V and will sink a maximum of 40 mA
- Active/standby: 15 way ‘D’ type plug, inputs are active low and logic outputs are capable of sinking 3mA, the +5V LED output will supply 500 mA
- Video: BNC
- Timecode: 9 way ‘D’ plug
- Reference loop through: BNC

Power

- 110/220/240V AC 10%
- Fully equipped 50/60Hz at 100VA
- Dual power supply configuration

Mechanical

- Frame: 3U 19” rack frame
- Width: 483mm
- Depth: 490mm
- Height: 133mm
- Weight: 7.2kg (frame and power supplies), 10.5 kg (fully equipped frame and power supplies)

General

- Temperature range: 0°C to +40°C

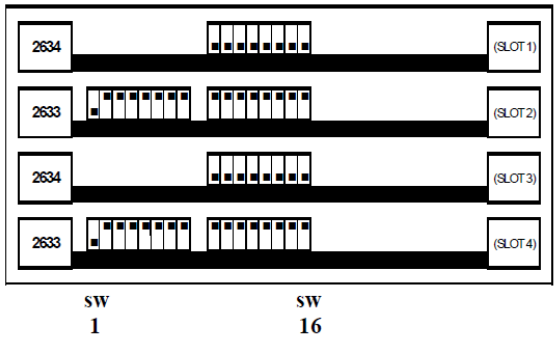
Appendix A. Aurora

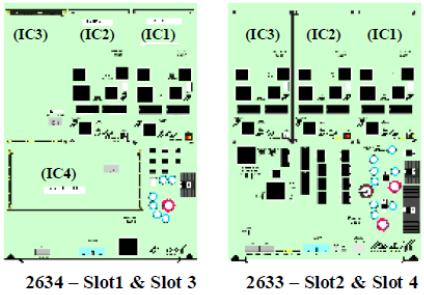
A.1 Single Frame – Internal Expansion

The diagrams below show the 2633 & 2634 positions in a Fully Populated Aurora Frame. Switches on these cards determine the function of the relevant ports on the rear of the frame.

The switch settings in Fig 24. show the Factory Default settings. Other switch/port configurations are discussed later.

Configuration 1: 16 Device (panels) Ports, 16 Matrix Ports, 2 Remote Ports
(factory default)





2634 – Slot1 & Slot 3 2633 – Slot2 & Slot 4

2634 in Slot 1

	IC1	IC2	IC3	IC4
Rear Port of Frame	Ports 17-24	Ports 25-32	2638	not used
Aurora Editor Port	Device 9-16	Matrix 9-16	cues	not used

2633 in Slot 2

	IC1	IC2	IC3
Rear Port of Frame	Remote 1 Remote 2 Config A	Ports 1-8	Ports 9-16
Aurora Editor Port	Config A	Device 1-8	Matrix 1-8

2634 in Slot 3

	IC1	IC2	IC3	IC4
Rear Port of Frame	Ports 17-24	Ports 25-32	2638	not used
Aurora Editor Port	Device 9-16	Matrix 9-16	cues	not used

2633 in Slot 4

	IC1	IC2	IC3
Rear Port of Frame	Remote 1 Remote 2 Config B	Ports 1-8	Ports 9-16
Aurora Editor Port	Config B	Device 1-8	Matrix 1-8

The tables to the left show the Port function, the Physical Port locations on the rear of the frame and the corresponding 'Port to Matrix Assignment' number contained within the Aurora Editor.

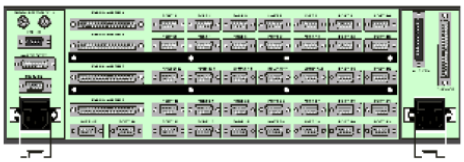


Fig 24. Configuration 1: 16 Device (panels) Ports, 16 Matrix Ports, 2 Remote Ports

Note:

- If the 2633 card is used without a 2634 card the Aurora frame has 8 Device (panels) Ports, 8 Matrix Ports, 2 Remote Ports
- No backup Processor is fitted if Slot 3 and Slot 4 are empty.

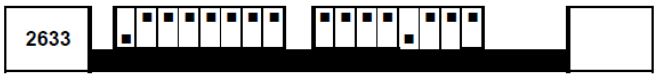
A.2 Other Configurations for a Single Frame

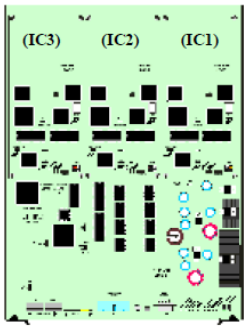
It is possible to change the switches on the 2633 card to suit a number system environments. Changing the switches 13, 14, 15 on the 2633 modifies the 'mix' of ports on the rear of the Aurora Controller.

The switches on the 2634 should remain set to the down position.

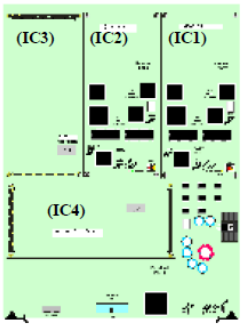
Note: For Clarity only the switch settings of one of the 2633 cards is shown. Both 2633 cards must be set identically.

Configuration 2: 16 Device Ports, 16 Matrix Ports & 2 Remote Ports





2633 (Slots 2 & 4)



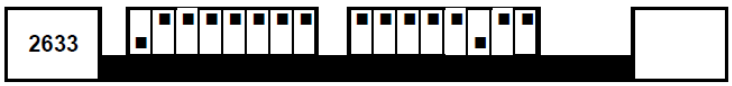
2634 (slots 1 & 3)

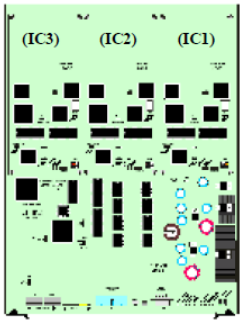
	IC1	IC2	IC3
Rear Port Number	Remote 1 Remote 2 Config A	Ports 1-8	Ports 9-16
Editor Port	Config A	Device 1-8	Device 9-16

	IC1	IC2	IC3	IC4
Rear Port Number	Ports 17-24	Ports 25-32	2638	not used
Editor Port	Matrix 1-8	Matrix 9-16	cues	not used

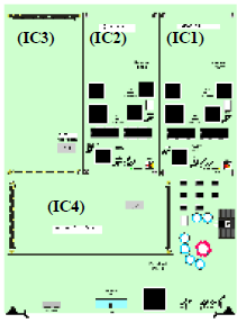
Fig 25. Configuration 2: 16 Device Ports, 16 Matrix Ports & 2 Remote Ports

Configuration 3: 8 Device Ports, 24 Matrix Ports, 2 Remote Ports





2633 (Slots 2 & 4)



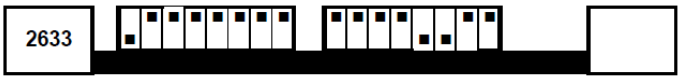
2634 (slots 1 & 3)

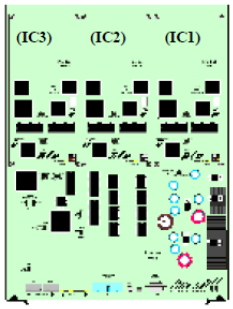
	IC1	IC2	IC3
Rear Port Number	Remote 1 Remote 2 Config A	Ports 1-8	Ports 9-16
Editor Port	Config A	Device 1-8	Matrix 1-8

	IC1	IC2	IC3	IC4
Rear Port Number	Ports 17-24	Ports 25-32	2638	not used
Editor Port	Matrix 9-16	Matrix 17-24	cues	not used

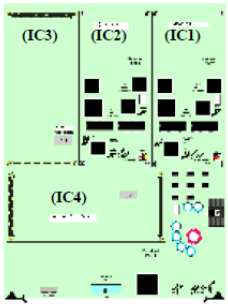
Fig 26. Configuration 3: 8 Device Ports, 24 Matrix Ports, 2 Remote Ports

Configuration 4: 24 Device Ports, 8 Matrix Ports and 2 Remote Ports





2633 (Slots 2 & 4)



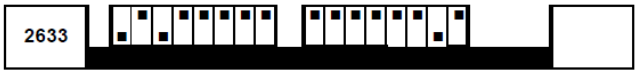
2634 (slots 1 & 3)

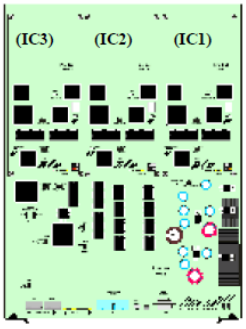
	IC1	IC2	IC3
Rear Port Number	Remote 1 Remote 2	Ports 1-8	Ports 9-16
Editor Port	Config A	Device 1-8	Device 8-16

	IC1	IC2	IC3	IC4
Rear Port Number	Ports 17-24	Ports 25-32	2638	not used
Editor Port	Device 17-24	Matrix 1-8	cues	not used

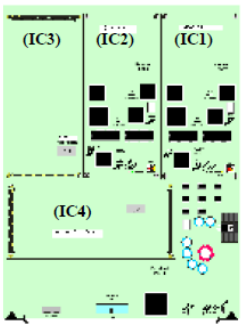
Fig 27. Configuration 4: 24 Device Ports, 8 Matrix Ports and 2 Remote Ports

Configuration 5: 8 Device Ports, 16 Matrix Ports, 6 Remote Ports





2633 (Slots 2 & 4)



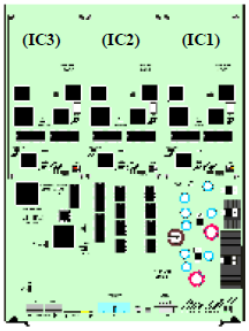
2634 (slots 1 & 3)

	IC1	IC2	IC3
Rear Port Number	Remote 1 Remote 2	Ports 1-8	Ports 9-16
Editor Port	Config A	Device 1-8	Matrix 1-8

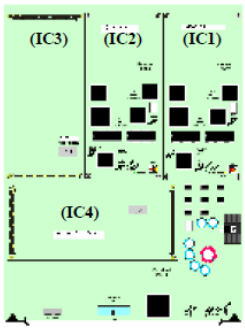
	IC1	IC2	IC3	IC4
Rear Port Number	Ports 17-20	Ports 25-32	2638	not used
Editor Port	Remote not shown on editor	Matrix 9-16	cues	not used

Fig 28. Configuration 5. 8 Device Ports, 16 Matrix Ports, 6 Remote Ports

Configuration 6: 16 Device Ports, 8 Matrix Ports, 6 Remote Ports



2633 (Slots 2 & 4)



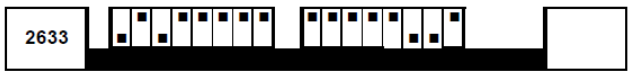
2634 (slots 1 & 3)

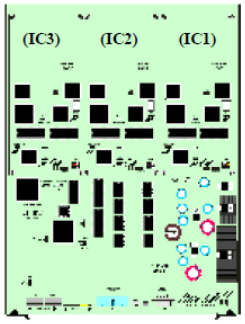
Rear Port Number	Remote 1 Remote 2	Ports 1-8	Ports 9-16
Editor Port	Config A	Device 1-8	Matrix 1-8

	IC1	IC2	IC3	IC4
Rear Port Number	Ports 17-24	Ports 25-28	2638	not used
Editor Port	Device 9-16	Remote not shown on editor	cues	not used

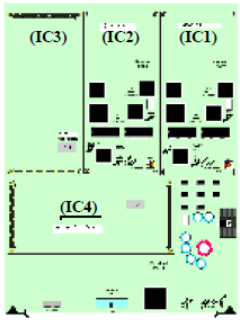
Fig 29. Configuration 6. 16 Device Ports, 8 Matrix Ports, 6 Remote Ports

Configuration 7: 16 Device Ports, 4 Matrix Ports, 10 Remote Ports





2633 (Slots 2 & 4)



2634 (slots 1 & 3)

	IC1	IC2	IC3
Rear Port	Remote 1 Remote 2	Ports 1-8	Ports 9-16
Editor Port	Config A	Device 1-8	Matrix 1-8

	IC1	IC2	IC3	IC4
Rear Port	Ports 17-20	Ports 25-28	2638	not used
Editor Port	Remote not shown on editor	Remote not shown on editor	cues	not used

Fig 30. Configuration 7. 16 Device Ports, 4 Matrix Ports, 10 Remote Ports

A.3 External Expansion

Each Expansion Frame can be configured for a mix of Matrix, Device and Remote Ports depending on the switch settings on the front of the 2634 card. Each 2634 in slot 1 (or 3) allows extra Cues to be added. As with the Main Processor Frame, if there are no backup cards required slot 3 and slot 4 are empty.

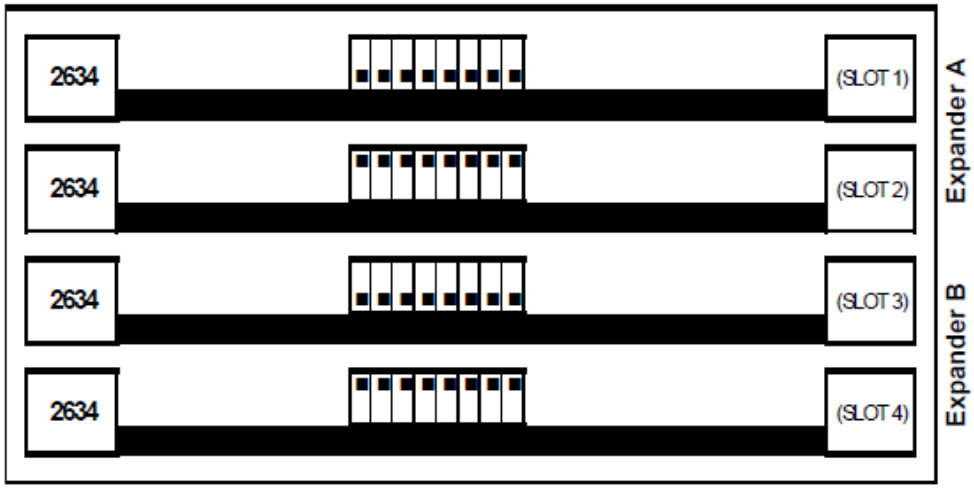


Fig 31. External Expansion

Sub Module 2637 Positions and Physical Rear Port Number

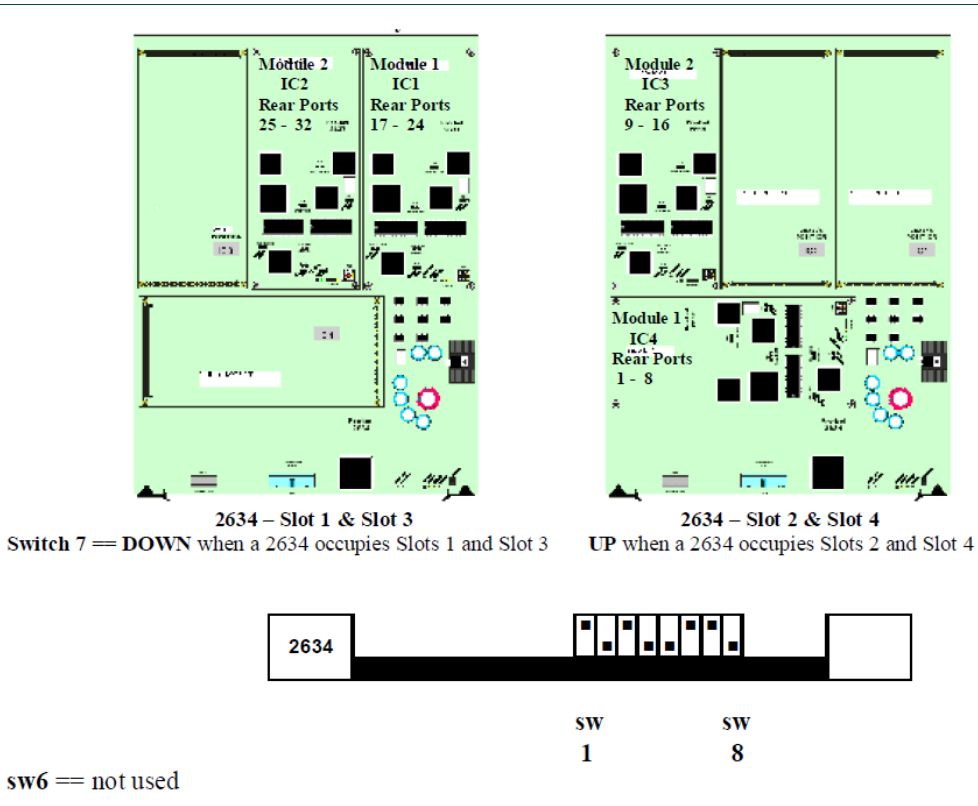


Fig 32. Sub Module 2637 Positions and Physical Rear Port Number

For Clarity only the switch settings of the 2634 cards in Expander A are shown.

If using a backup pair, the relevant switches of Expander B must be set to the identical settings of Expander A. The switch settings of Slot 1 must match Slot 3, the switch settings of Slot 2 must match Slot 4.

Expansion Frame Switch Settings:

Adding Device ports;

Each 2634 adds 16 Device ports when configured as shown in Table 36.

Device Ports	SW1	SW2	SW3	SW4	SW5
to add 1st 16	UP	DOWN	DOWN	DOWN	DOWN
to add 2nd 16	DOWN	UP	DOWN	DOWN	DOWN
to add 3rd 16	UP	UP	DOWN	DOWN	DOWN
to add 4th 16	DOWN	DOWN	UP	DOWN	DOWN

Table 36. Adding Device Ports

Adding Matrix ports;

Each 2634 adds 16 Matrix ports when configured as shown in Table 37.

Matrix Ports	SW1	SW2	SW3	SW4	SW5
to add 1st 16	UP	DOWN	UP	DOWN	DOWN
to add 2nd 16	DOWN	UP	UP	DOWN	DOWN
to add 3rd 16	UP	UP	UP	DOWN	DOWN
to add 4th 16	DOWN	DOWN	DOWN	UP	DOWN
to add 5th 16	UP	DOWN	DOWN	UP	DOWN
to add 6th 16	DOWN	UP	DOWN	UP	DOWN
to add 7th 16	UP	UP	DOWN	UP	DOWN
to add 8th 16	DOWN	DOWN	UP	UP	DOWN

Table 37. Adding Matrix Ports

Adding Remote ports;

The 2634 adds 8 Remote ports when configured as shown in Table 38.

Remote Ports	SW1	SW2	SW3	SW4	SW5
to add 8 Ports	UP	DOWN	UP	UP	DOWN

Table 38. Adding Remote ports

Special Combinations

It is possible to add a combination of Device/Matrix/Remote ports using the 2634 card.

The 2634 adds a mix of 8 Device 8 Matrix 4 Remote ports when configured as shown in Table 39.

Note: As these special combinations may only be used once in each system, it is best to expand Aurora controllers in blocks of 16 Device or Matrix ports.

Sub Module 1 (IC4)	Sub Module 2 (IC3)	SW1	SW2	SW3	SW4	SW5
to add 8 Device Ports	AND 8 Matrix Ports	DOWN	UP	UP	UP	DOWN
to add 8 Device Ports	AND 4 Remote Ports	UP	UP	UP	UP	DOWN
to add 4 Remote Ports	AND 8 Matrix Ports	DOWN	DOWN	DOWN	DOWN	UP

Table 39. Special Combinations

When adding to an existing Expanded System, use 2634 switch settings that have not been used in the original set-up.

Expansion Frame Termination

The final Expansion frame MUST BE TERMINATED. The termination is set by sw8

Switch 8 = UP for the last Expansion frame in system, terminates the BUS
Switch 8 = DOWN for ALL other Expansion frames

A.4 Expansion Example

The customer requires an extra 24 Matrix Ports, 8 Device Ports and 4 Remote Ports connected to the Factory default Aurora Mainframe - 16 device ports, 16 matrix ports and 2 remote ports.

Therefore they require

- 1 off 2634 with the switches set as a 16 Matrix Port
- 1 off 2634 with the switches set as a 8 Matrix-8 Device Combination
- 1 off 2634 with the switches set as a 8 Remote Port

Expansion Frame 1 Contains;

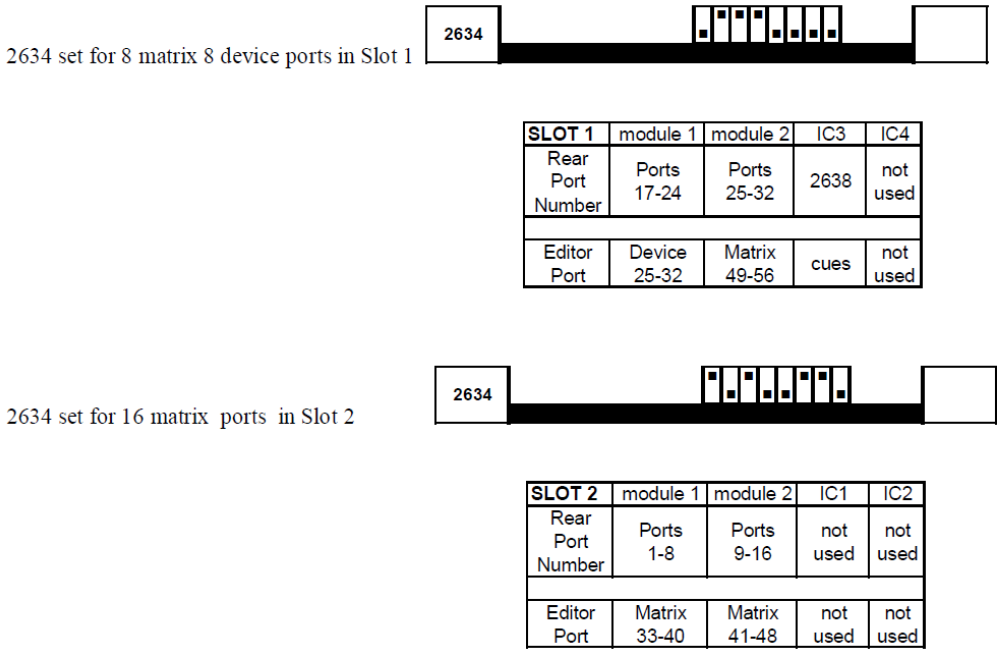


Fig 33. Expansion Frame 1 Contains

Expansion Frame 2 Contains;

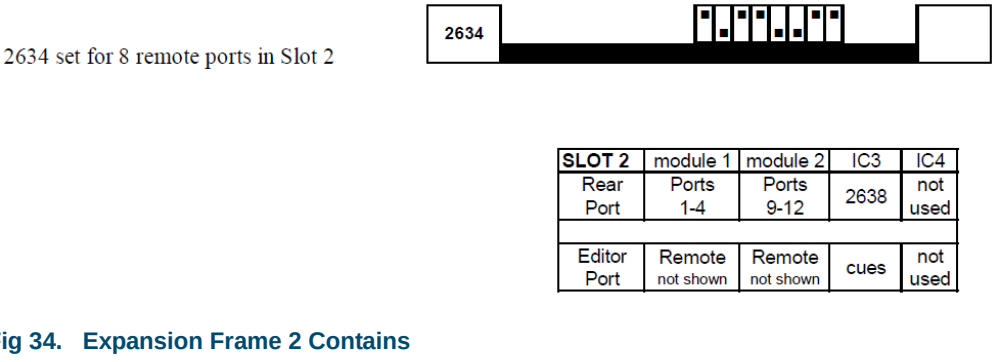


Fig 34. Expansion Frame 2 Contains

Important Points:

Switch 7 = DOWN when a 2634 occupies Slots 1 and Slot 3
Switch 7 = UP when a 2634 occupies Slots 2 and Slot 4

Switch 8 = UP for the last Expansion frame in system, terminates the BUS
Switch 8 = DOWN for ALL other Expansion frames

