USER MANUAL FOR
SX-4000 STANDALONE INTEGRATED MEDIA BLOCK™

SMS version 10.0

October 27th, 2021

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Thank you for purchasing a GDC SX-4000 Standalone Integrated Media Block™ from GDC Technology Limited.

To ensure proper operation and to maximize value of SX-4000, please review this User Manual. It will guide you through all the features and benefits.

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MANUAL DISCLAIMER

This manual is made with SMS version 10.0 and there might be slight differences depending on the software version the IMB is running. The contents, features and specifications stated in this manual are subject to change without notice due to continuous product development and improvements. In no other event shall GDC Technology Limited be liable for any loss of profit or any other commercial damages, including but not limited to special, consequential, or other damages.

FCC COMPLIANCE STATEMENT

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

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1. INTRODUCTION

1.1. About This Manual

This user manual provides instructions on how to use and manage the GDC SX-4000 Standalone Integrated Media Block™ (SX-4000 Standalone IMB®). The user interface of the IMB consists of a few key components described in the diagram below **[Figure 1]**. The manual has sections on each of these components describing how it can be used to operate the IMB.

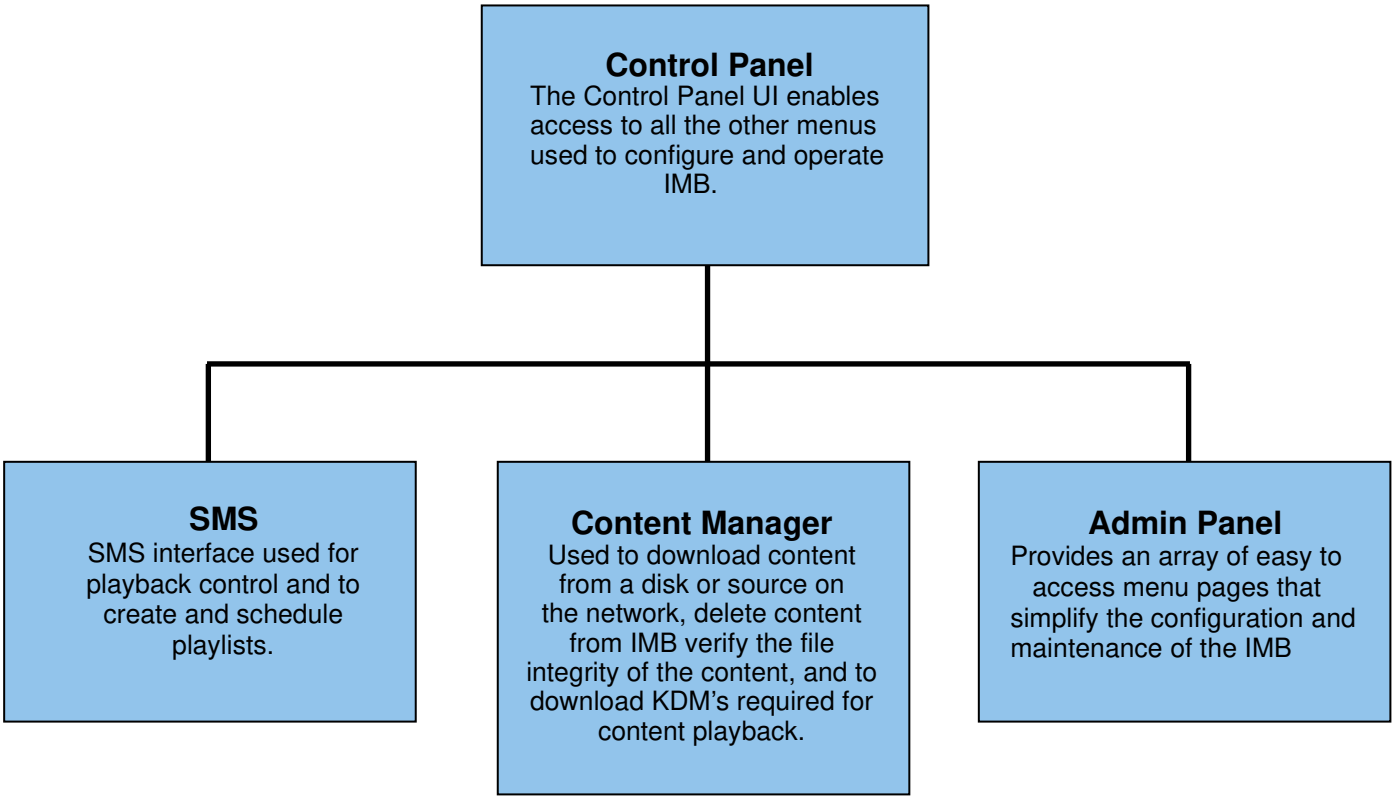


Figure 1 IMB UI components.

1.2. Safety Instructions

1.2.1. General Safety Instructions

- The SX-4000 is intended for installation in a restricted access location.
- The operation environment required should be 0ºC - 40ºC (32ºF - 104ºF).
- For PLUGGABLE EQUIPMENT, the socket outlet should be installed near the equipment and should be easily accessible.
- Before operating your SX-4000, please read this manual thoroughly, and retain it for future reference.
- Installation and preliminary adjustments should be performed by qualified GDC Technology personnel. All warnings on the SX-4000 in the documentation manual should be adhered to.
- All instructions for operating and maintaining SX-4000 must be followed closely.

1.2.2. Electrical Safety

Safety Warning

- DO NOT expose the SX-4000 to rain or moisture, to prevent fire or electrical shock hazard.
- Use a dry cloth when cleaning SX-4000.
- DO NOT block any ventilation openings.
- DO NOT install near any heat sources (e.g., radiators, stove or other apparatus that produce heat).
- Consult GDC Tech Support for servicing or maintaining SX-4000.
- You are cautioned that any change or modification not expressly approved in this manual or approved in writing by an authorized representative of GDC Technology could void your warranty and/or authority to operate SX-4000.

2. SMS

2.1. About the SMS Interface

The SMS interface is used for playback control, creating and editing playlists, scheduling. It also provides access to advanced configuration options.

2.2. Accessing the SMS Interface

Figure 2 SMS interface.

1	Enter the user password to access the ***SMS*** interface as seen in **Figure 2**.

2.3. Understanding the SMS Interface

2.3.1. SMS Interface

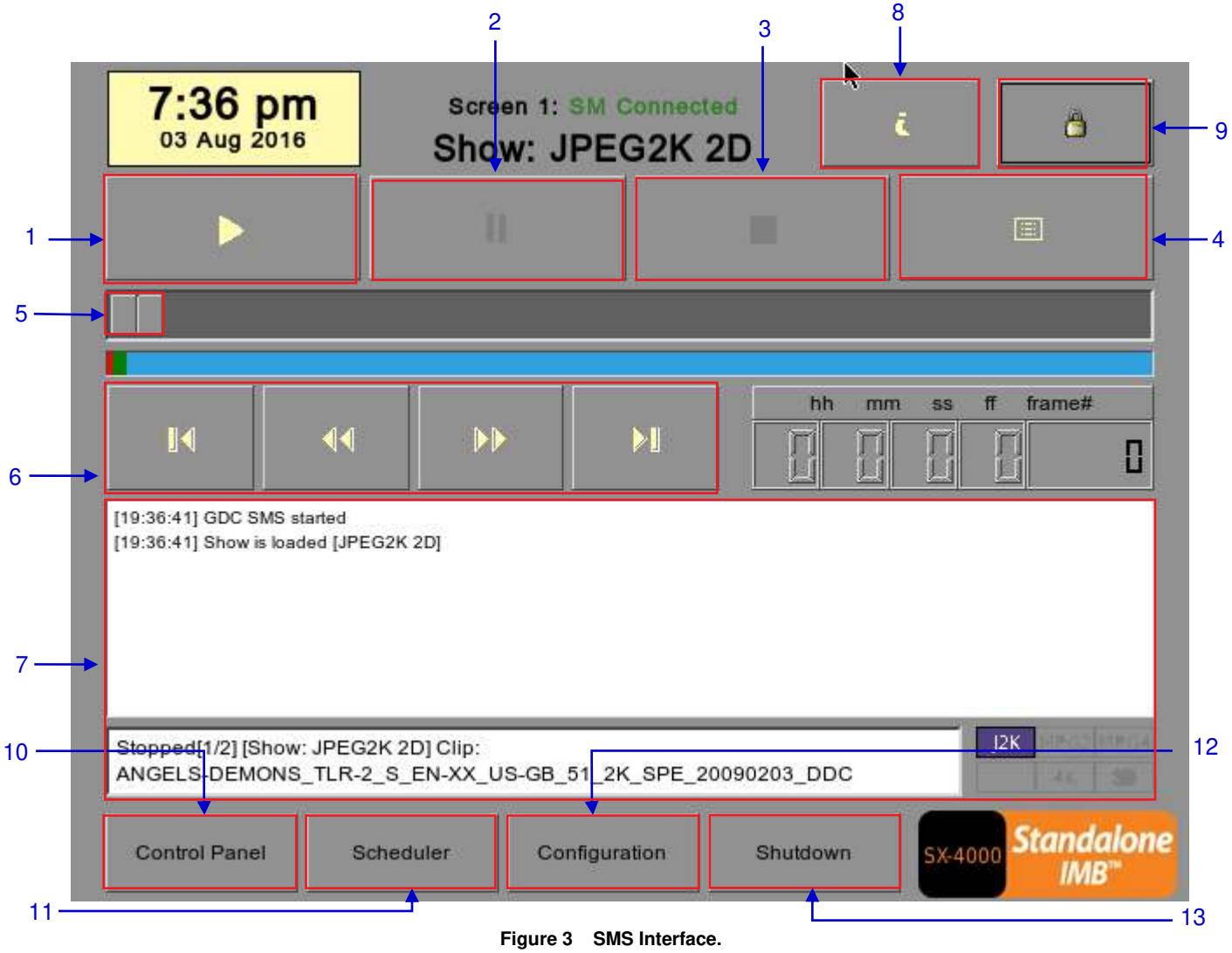
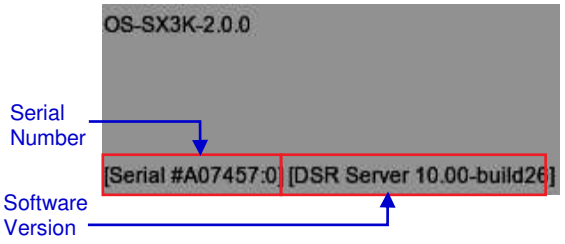


Figure 3 SMS Interface.

1	[▶]	Play button. The [▶] button starts playback when pressed, and is disabled when the system is in paused mode.
2	[‖]	Pause button. The [‖] button is enabled when the system is in playing or pause mode. To resume from pause simply hit the Pause button again.
3	[■]	Stop button. The [■] button is enabled when the system is in playing mode, and stops playback when pressed.
4	[☰]	Playlist button. Press [☰] to open the Playlist Management to create a playlist. For more information about the Playlist Management, please refer to **Section 2.3.2**. further below.

5	[Slider Bar]	It will start advancing when [►] is pressed to start a playback. One clip will take one complete cycle from the left to the right. The Slider Bar always returns to the starting point (extreme left) after a clip is finished. When [■] is pressed, the Slider Bar will stop and return to its starting point. When playback is paused, the Slider Bar can be moved to the left (for rewinding) or to the right (for forwarding).
6	[|◄] [◄◄] [►►] [►]	Move to the first frame of the clip. Rewind (move back) by the number of frames of the playback. Forward (move forward) by the number of frames of the playback. Move to the last frame of the clip.
7	[Status Display]	Reports the status of the system. The display shows the number of clips in the active playlist, the name of the active playlist, and the name of the clip currently being played.
8	[*i*]	INFORMATION button. If [*i*] is pressed when the system is in stopped mode, the system will show the serial number and the software version of the IMB. A text box will appear beside the Timecode Display (replacing the navigating buttons [|◄] [◄◄] [►►] [►]) and the text box will show the serial number and software version of the IMB. 
9	[🔒]	SCREEN LOCK button - The SCREEN LOCK function will prevent any unintentional screen touches or mouse clicks that could disturb playback. The screen will be locked when [🔒] button is pressed. No access to the SMS Interface (or associated interfaces) is allowed when the screen is locked. The User level password or higher is needed to unlock the screen. If the screen is locked while the system is playing, the name, duration and the remaining time of the clip will be shown on the screen while the clip is playing.
10	[Control Panel]	CONTROL PANEL button – For returning to the control panel screen of the user interface.
11	[Scheduler]	SCHEDULER button – For scheduling the time and date of the playlists to be shown. The playlist can also be looped for a period of time. For more information about Scheduler, please refer to Section 2.3.3. Scheduler.
12	[Configuration]	CONFIGURATION button – For changing the general options on the system (e.g., enable startup/ shutdown password, change access level passwords, perform software upgrade, etc.). For more information, please refer to **Section 2.3.4.**
13	[Shutdown]	SHUTDOWN button. For shutting down the IMB or restarting the application. For more information, please refer to Section 2.9 Shutdown/Restart Application.

2.3.2. Playlist Management

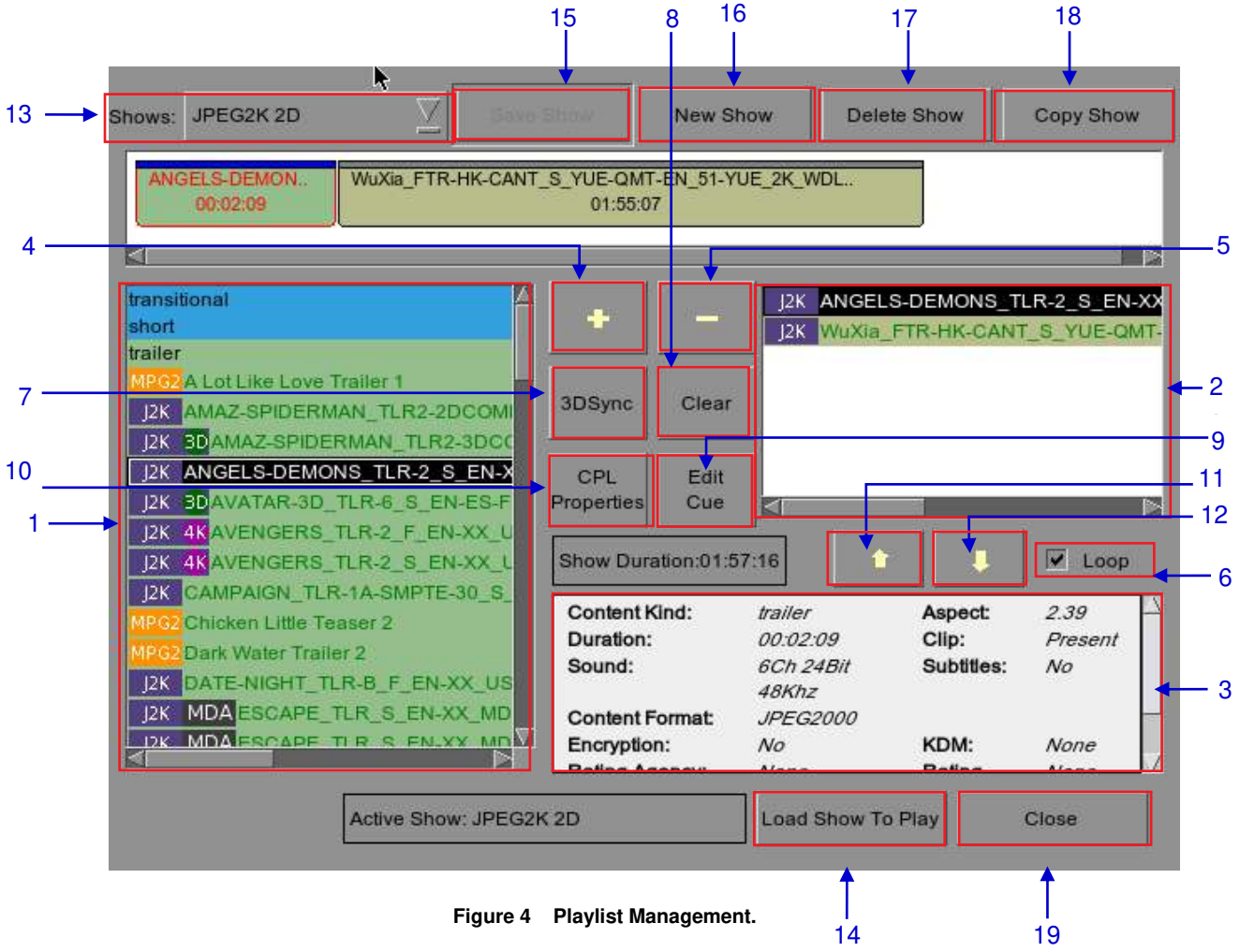
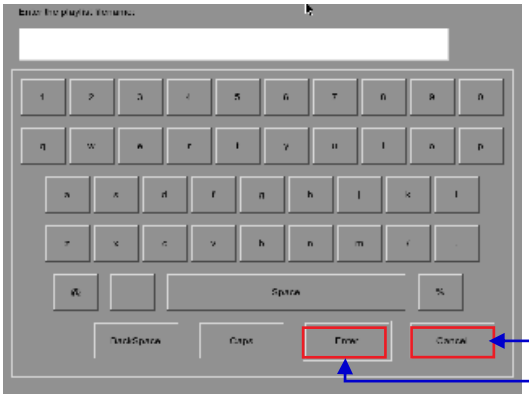


Figure 4 Playlist Management.

1	[IMB Content]	The IMB content is listed here. Content is shown in alphabetical order and grouped under categories such as Trailer, Feature, *etc...* Available automation cues are listed under Cues. HDMI content can also be added to the playlist.
2	[Playlist Content]	The contents of the playlist being currently edited are shown here.
3	[Clip Information]	Displays information about the selected item in the Content. This includes the Name, total Duration, Sound (Audio) format, Content format, if Encryption is present, if a Composition Playlist exists, if it has Subtitles and if a current KDM is on the IMB.
4	[+]	Adds content to the Playlist by pressing [+] after an item from the Content section is selected.
5	[-]	Removes the selected item from the Playlist content.

6	[Loop]	When [Loop] is selected, the contents in the Playlist will run continuously in a loop when [▶] is pressed.
7	[3D Sync]	Synchronizes clips for 3D showing.
8	[Clear]	Removes all clips on the playlist.
9	[Edit Cue]	Click the Edit Cue button to bring up the cue editing interface, used to add, remove or edit existing automation cues for the selected clip in the playlist (See Section 2.4.1.3.).
10	[CPL Properties]	Shows the properties of selected CPL
11	[🡅]	Moves the highlighted clip in the Playlist ahead in chronological order. Makes sure an item is selected from the Playlist before pressing [🡅]. When [🡅] is pressed, the selected item will move to before the previous clip.
12	[🡇]	Moves the highlighted clip in the Playlist down in chronological order. Makes sure an item is selected from the Playlist before pressing [🡇]. When [🡇] is pressed, the selected item will move to after the next clip.
13	[Shows]	This displays a list of all the playlists saved. Selecting a playlist here displays the contents of the playlist for editing. A playlist that is currently playing may not be edited. **NOTE:** Selecting a playlist here does not load it for playback. The "Load Show to Play" button has to be pressed to load the playlist into the player for playback.
14	[Load Show To Play]	Loads the selected playlist into the player for playback.
15	[Save Show]	Saves the playlist currently being edited.
16	[New Show]	Creates a new blank show playlist. A name must be specified for the playlist.
17	[Delete Show]	Make sure an item is selected in the Shows drop-down menu. When [Delete Show] is pressed, the system will delete the selected playlist and remove it from the Shows drop-down menu. The delete action is irreversible. The system will prompt you to confirm the delete action before it proceeds to delete the playlist.
18	[Copy Show]	Duplicates currently selected playlist. When [Copy Show] is pressed, a text entry keypad will appear for you to enter the new name of the duplicate playlist.

		 Type in the desired name and press [Enter] to complete the action. To cancel the action and return to the previous screen, press [Cancel].
19	[Close]	Exits the Playlist Management and returns to the SMS Interface.

2.3.3. Scheduler

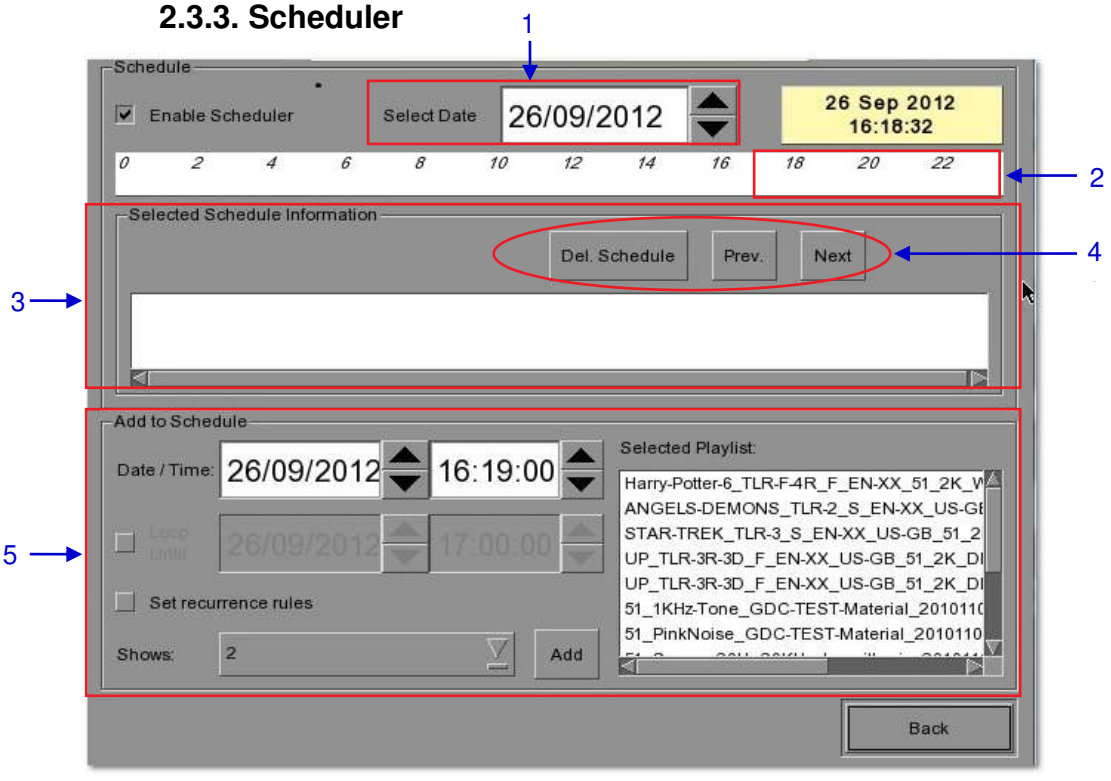


Figure 5 Scheduler

1	[Select Date]	Specifies the date and time of the schedule.
2	[Timeline]	Displays shows scheduled on a 24-hour timeline for the date selected in (1).
3	[Selected Schedule Information]	Displays information such as name, time and duration of the selected show schedule.
4	[Delete Schedule] [Previous], [Next]	Deletes the currently selected show schedule. Navigate show schedules by going forward and backward one at a time.
5	[Add to Schedule]	(a) Select the playlist to be scheduled. The contents of the selected playlist will be displayed in the “Selected Playlist” window. (b) Select the time for the scheduled show. (c) To loop the show until a certain time, check ‘Loop until’ and select the time. (d) If the schedule is to be repeated every day or week, check ‘Set recurrence rules’. (e) Press the ‘Add’ button. A dialog will pop up for specifying the recurrence rules if it was checked.

2.3.4. Configuration

2.3.4.1. General

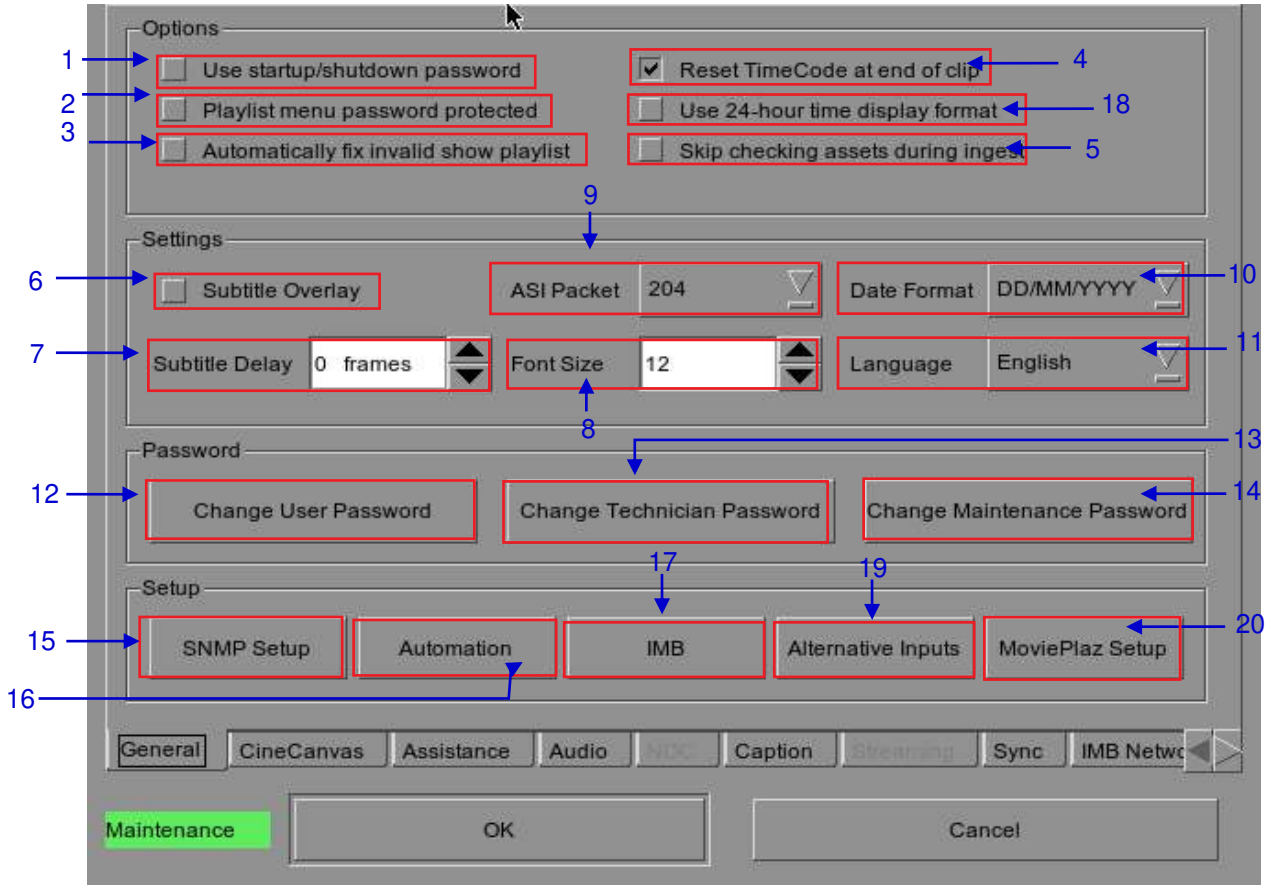


Figure 6 Configuration [General].

1	[Use startup / shutdown password]	There are three levels of users on the system - User, Technician, and Maintenance. If this option is checked, the system will start up with a password dialog and the user will have to authenticate themselves as one of the above 3 users to start using or shut down the system.
2	[Playlist Management password protected]	If this option is checked, the User level will be denied the ability to edit or create any playlists. Only Maintenance and Technician level users will be able to create and edit playlists.
3	[Automatically fix invalid show playlist]	If this option is checked, the invalid show playlists will be fixed automatically.
4	[Reset TimeCode at end of clip]	If the 'Reset TimeCode at end of clip' option is selected, the timecode will reset to zero [0:0:0:0] whenever a playback ends or stops. The Timecode Display will reset to zero [0:0:0:0] while the Duration and Remaining time will reset to 00 hr. 00 min. 00 sec. The Slider Bar will return to its starting point at the extreme left. If the 'Reset TimeCode at end of clip' option is not selected, the system will retain the timecode at the point in which playback ends or stops. The Slider Bar will remain at where the playback ends or stops.
5	[Skip checking assets during ingest]	With this option checked the Digital Cinema Package assets will not be checked for their integrity, this option will reduce ingestion time but decrease the reliability of the ingestion.
6	[Subtitle Overlay]	[Subtitle Overlay] option. For more information, please refer to **Section 2.8.2.**
7	[Subtitle Delay]	This option provides the ability to delay the on-screen subtitles, the delay is set in number of frames.
8	[Font Size]	'Font Size' option. For changing the size of the font on the screen.
9	[ASI Packet]	This option is provided to select the size of the packets (204 or 188 bytes) on the incoming ASI signal.
10	[Date Format]	'Date Format' option. For changing the displayed format of the date.
11	[Language]	'Language' option. For changing the user interface language.
12	[Change User Password]	[Change User Password] button. For changing the User Password. When [Change User Password] is pressed, 3 prompts will appear. The first prompt is for the user to enter the old password, the second prompt is for the user to enter the new password, and the third prompt is for the system to verify the new password.

13	[Change Technician Password]	[Change Technician Password] button. For changing the Technician Password. When [Change Technician Password] is pressed, 3 prompts will appear. The first prompt is for the user to enter the old password, the second prompt is for the user to enter the new password and the third prompt is for the system to verify the new password.
14	[Change Maintenance Password]	[Change Maintenance Password] button. For changing the Maintenance Password. When [Change Maintenance Password] is pressed, 3 prompts will appear. The first prompt is for the user to enter the old password, the second prompt is for the user to enter the new password and the third prompt is for the system to verify the new password.
15	[SNMP Setup]	[SNMP Setup] button. For accessing the SNMP Configuration Interface (see **Section 2.3.5**).
16	[Automation]	[Automation] button. This will bring up the automation configuration user interface used to integrate the IMB with external devices such as projectors and automation controllers (see **Section 2.3.6**).
17	[IMB]	[IMB] button. After connecting to the IMB the window will display the IMB version information as well as check the Marriage and Service Door status on the projector. For IMB marriage please reference the SX-4000 Installation manual as process will depend on projector manufacturer and software version.
18	[Use 24-hour time display format]	[Use 24-hour time display format] button. When this option is selected, time on the SMS interface will be displayed in 24-hour format. If this option is not selected, time on the SMS interface will be displayed in 12-hour format.
19	[Alternative Inputs]	[Alternative Inputs] button. This will bring up the Alternative Inputs configuration interface. This interface can be used to configure video output formats for HDMI and SDI formats.
20	[MoviePlaz Setup]	[MoviePlaz Setup] button. To setup the MoviePlaz configuration.

2.3.4.2. CineCanvas

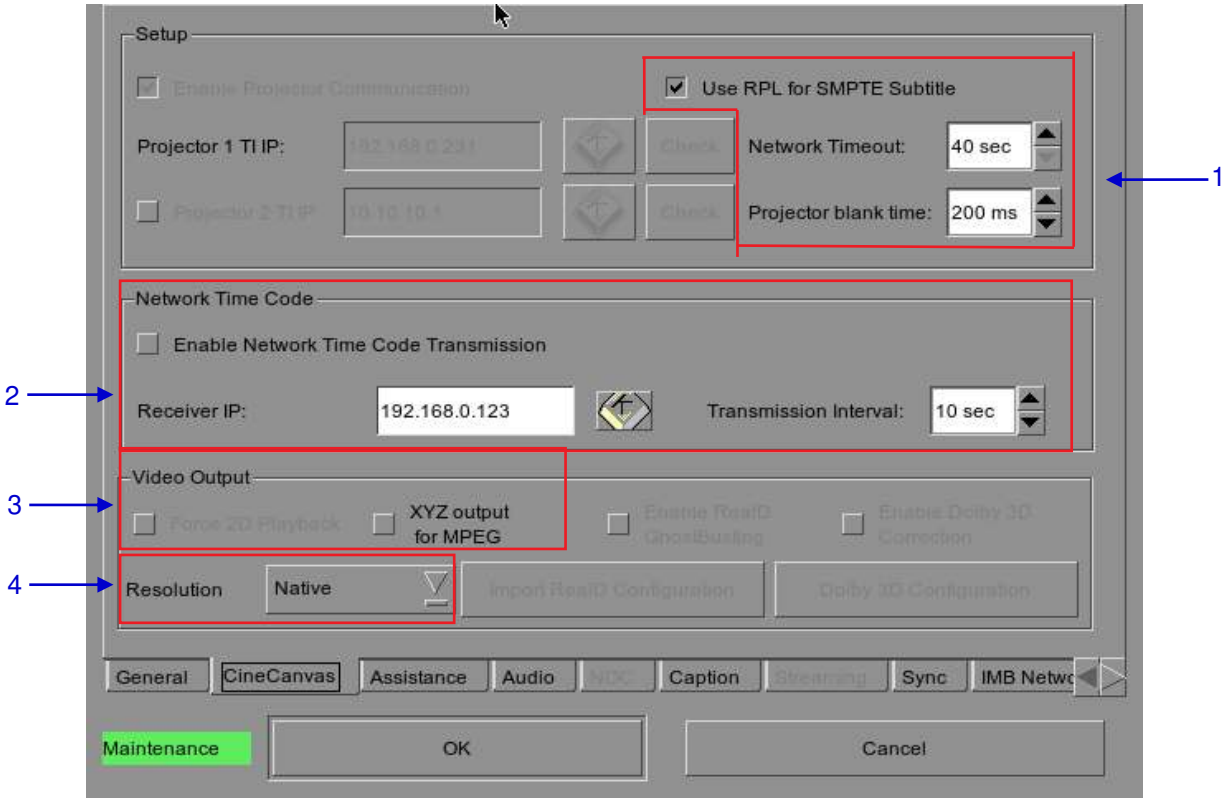


Figure 7 Configuration [CineCanvas].

1	[Use RPL for SMPTE Subtitle] [Network Timeout] [Projector blank time]	Send a SMPTE-compatible Resource Presentation List (RPL) instead of an Interop-compatible Subtitle Presentation List to the projector for Cinecanvas subtitles. This is only enabled when SMPTE subtitles are available for the CPL. Timeout in seconds for communication with the projector. Select the blank time of the projector during change of PCF or format. This is to prevent noise when the PCF or format is changed.
2	[Enable Network Time Code Transmission] [Receiver IP] [Transmission Interval]	Check this to activate transmission of playback time-code over UDP. Enter the IP of the receiver of time-code transmission of UDP. Indicates the time interval between transmissions.
3	[XYZ output for MPEG]	Check this to display XYZ video output for MPEG playback.
4	[Resolution]	Allows playback of mixed 2K and 4K content at a constant resolution. Video output will be scaled up or scaled down to the selected resolution. *Note: This feature will only affect video, and will not automatically scale PNG subtitles to the target resolution.*

2.3.4.3. Assistance

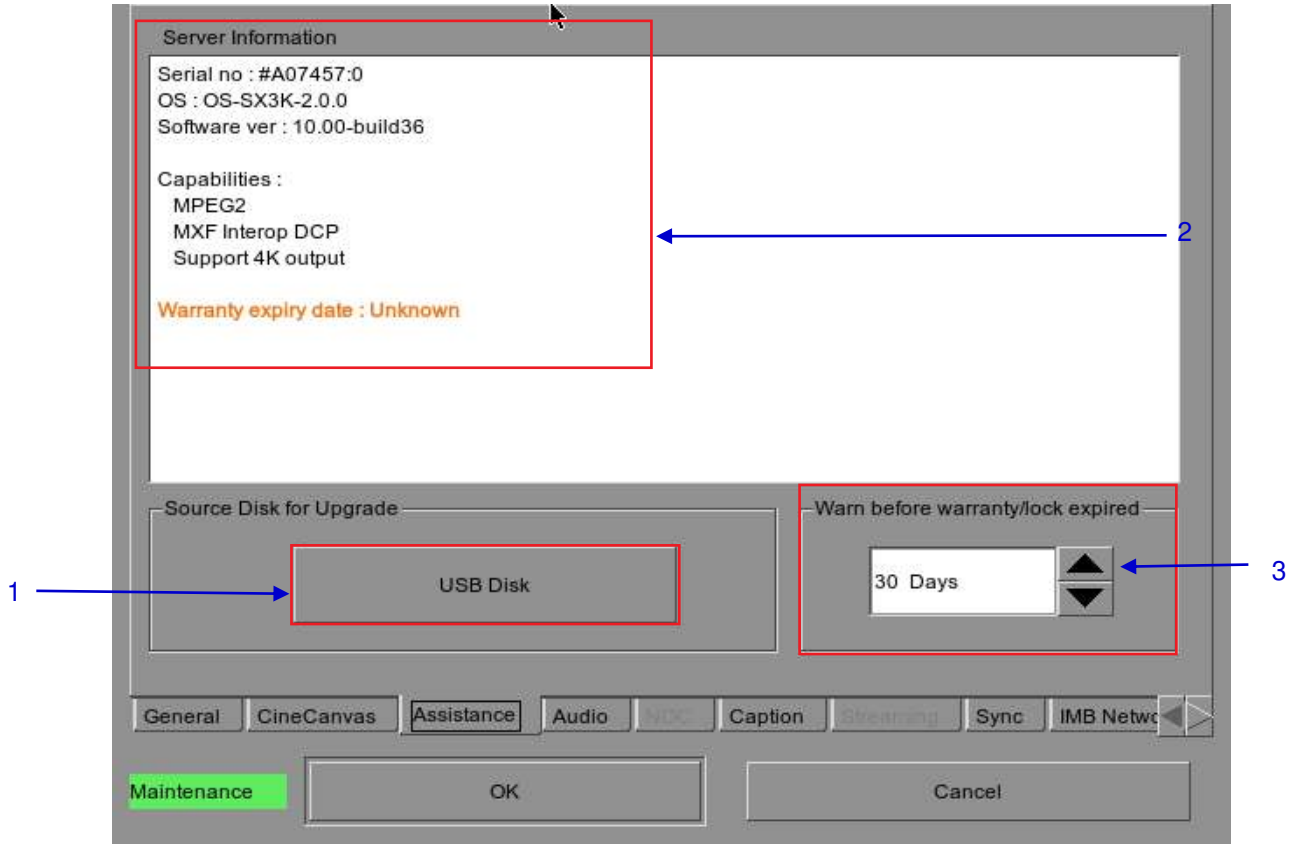


Figure 8 Assistance.

1	[USB Disk]	Press to perform software upgrades from USB Disk.
2	[Server Information]	Displays serial number, OS version, software version, video capabilities of the IMB and warranty expiry date.
3	[Warn before warranty /lock expired]	To set the number of days to show a warning before warranty/lock expired.

2.3.4.4. Audio Option

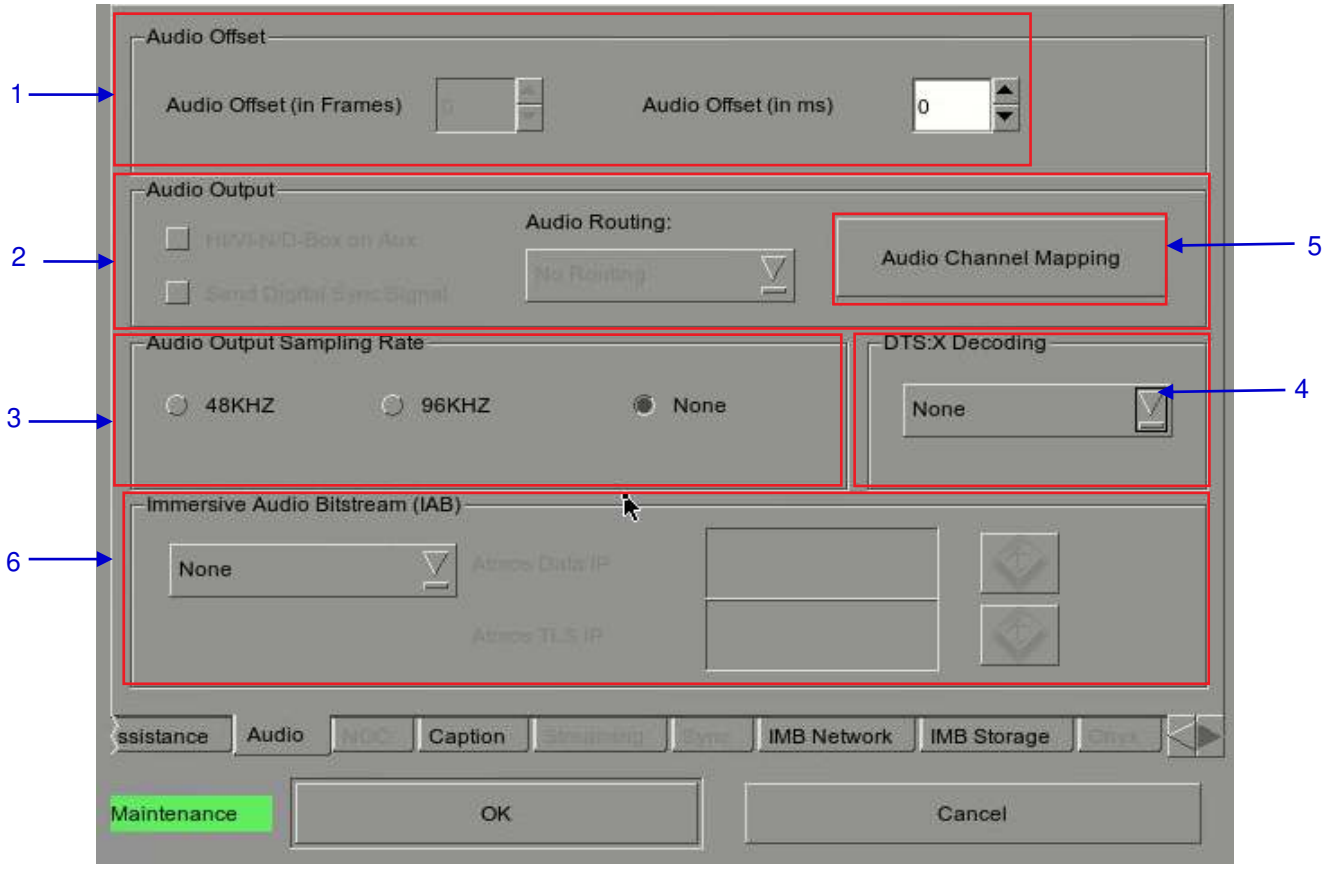


Figure 9 Audio option.

1	[Audio Offset]	Specify the audio delay to make the video and audio in sync. '+x' will move the audio x frames forward such that the audio comes earlier than before. '-x' will delay the audio by x frames such that the audio comes later than before.
2	[Audio Output]	Change the audio channel routing configuration for audio playback of content with 5.1 channel audio, 7.1 channel audio and DTS:X or IAB (Internal) audio without speaker re-configuration.
3	[Audio Output Sampling Rate]	Change audio output sampling rate. Output audio sampling rate can be fixed at 48kHz or 96kHz for all content, or it can match the content's audio sampling rate (option 'None'). If the output sampling rate is set to a fixed value (48kHz or 96kHz), content audio is re-sampled if it does not match the output sampling rate.
4	[DTS:X Decoding]	Please refer to **Section 7.3** for the settings of DTS:X Decoding.
5	[Audio Channel Mapping]	Use the audio channel mapping interface to map content audio channels to different audio output channels. Please refer to **Section 2.3.4.4.1** for the setting of Audio Channel Mapping.
6	[Immersive Audio Bitstream (IAB)]	Please refer to **Section 7.4** for the settings of Immersive Audio Bitstream (IAB).

2.3.4.4.1 Audio Channel Mapping

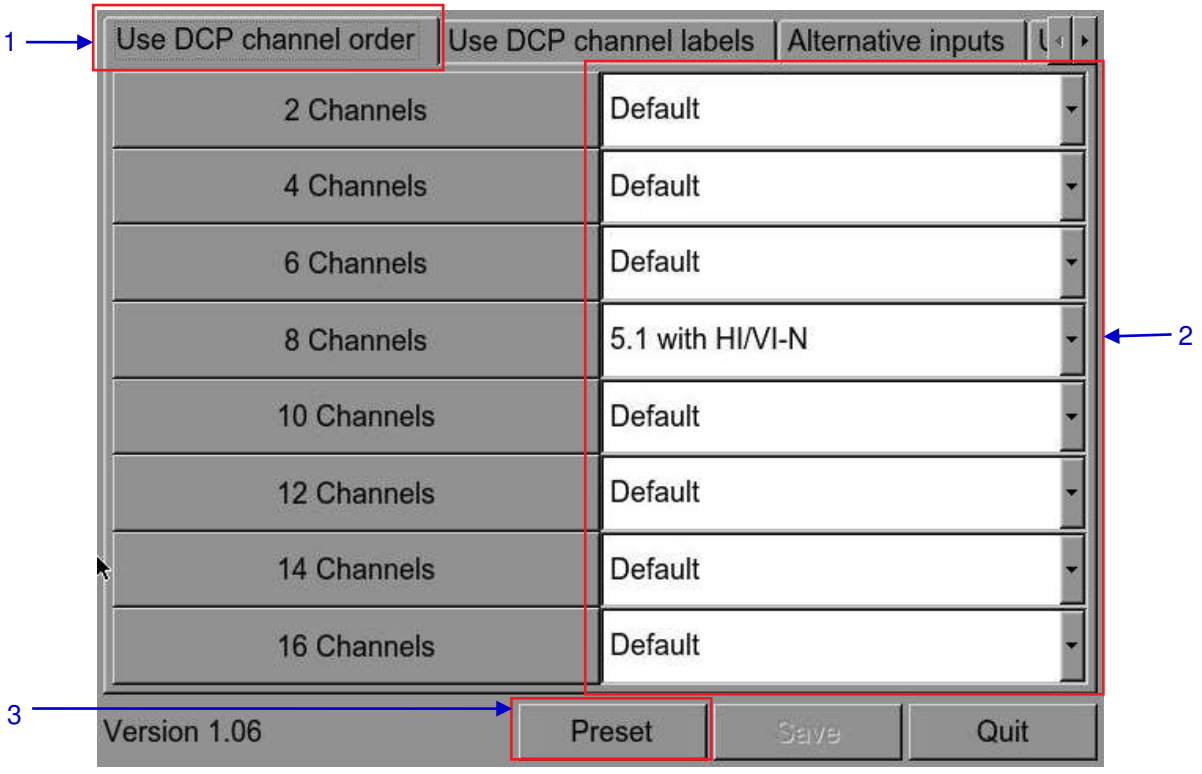


Figure 10 Using DCP channel order

1	Audio output based on the number of audio channels in the audio track of the DCP can be configured in this tab.
2	The preset for the number of audio channels in the audio track can be changed here.
3	Use the 'Preset' button to configure audio presets.

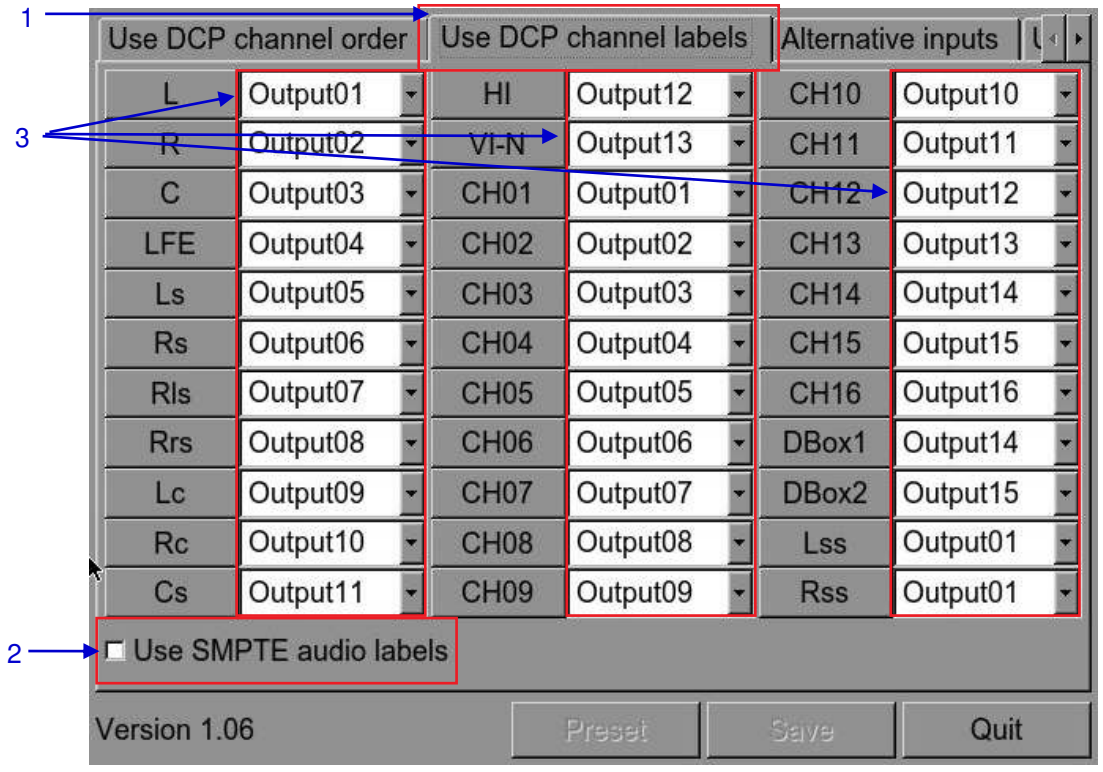


Figure 11 Use DCP channel labels

1	Audio output based on SMPTE audio channel configuration labels can be configured in this tab,
2	Check the 'Use SMPTE audio labels' checkbox to route audio output based on SMPTE audio channel configuration labels.
3	Audio output for individual SMPTE audio channel labels can be changed here.

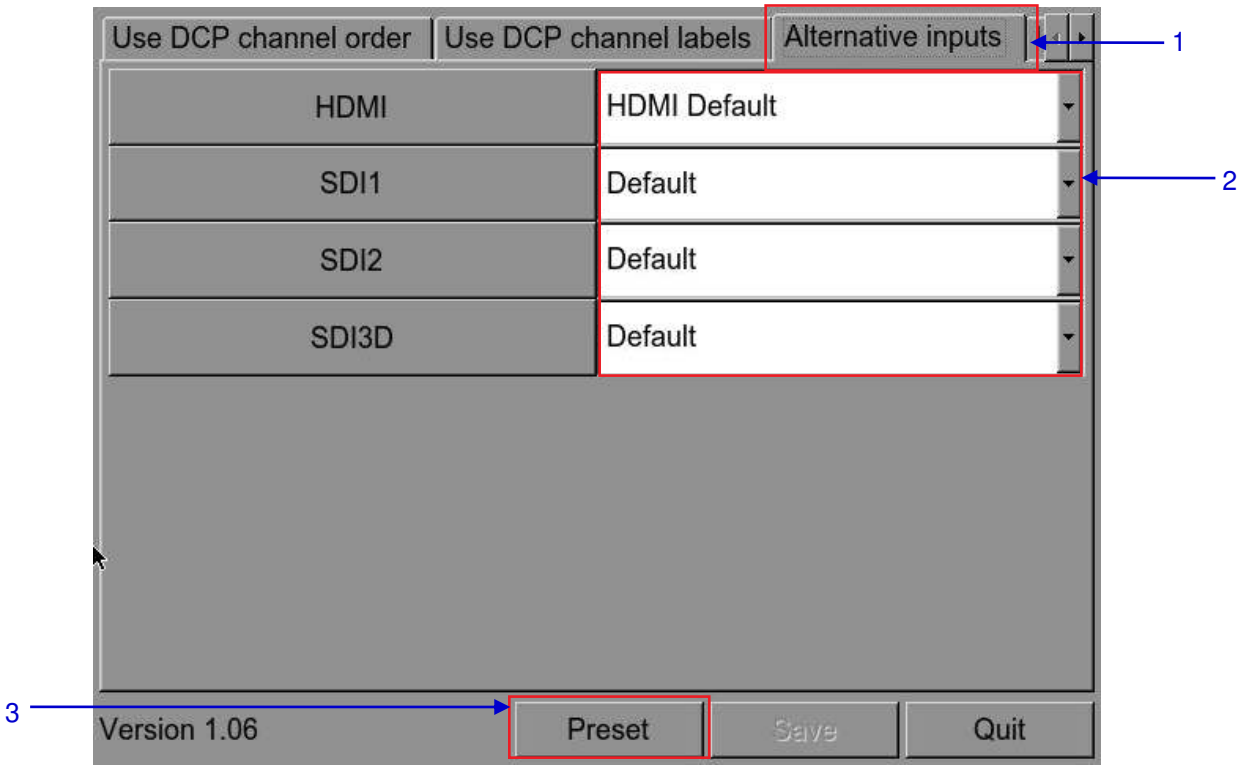


Figure 12 Alternative Inputs

1	Audio output for alternative (HDMI, SDI) inputs can be configured in this tab.
2	The audio output preset for each alternative input can be changed here.
3	Use the 'Preset' button to configure audio presets.

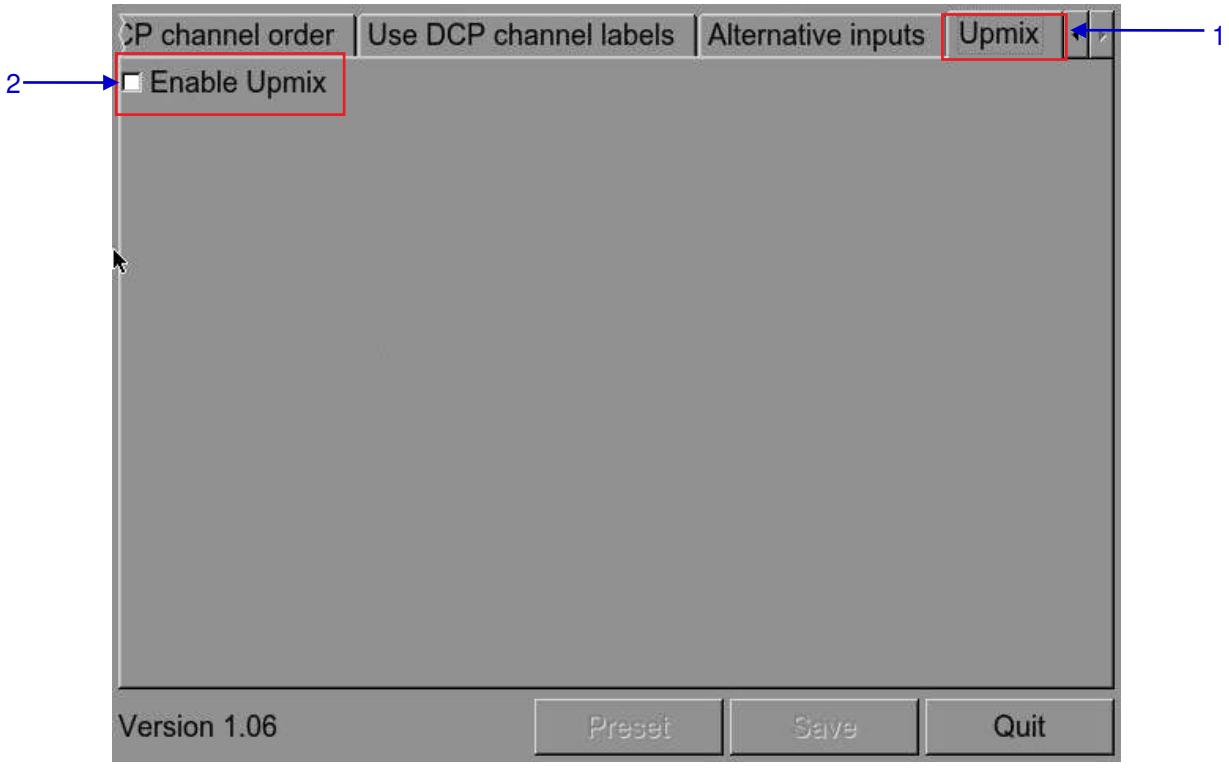


Figure 13 Upmix

1	Audio channel upmix can be enabled or disabled in this tab.
2	Check the 'Enable Upmix' checkbox to enable audio upmix. Please refer to Section 9 for more details on audio upmix.

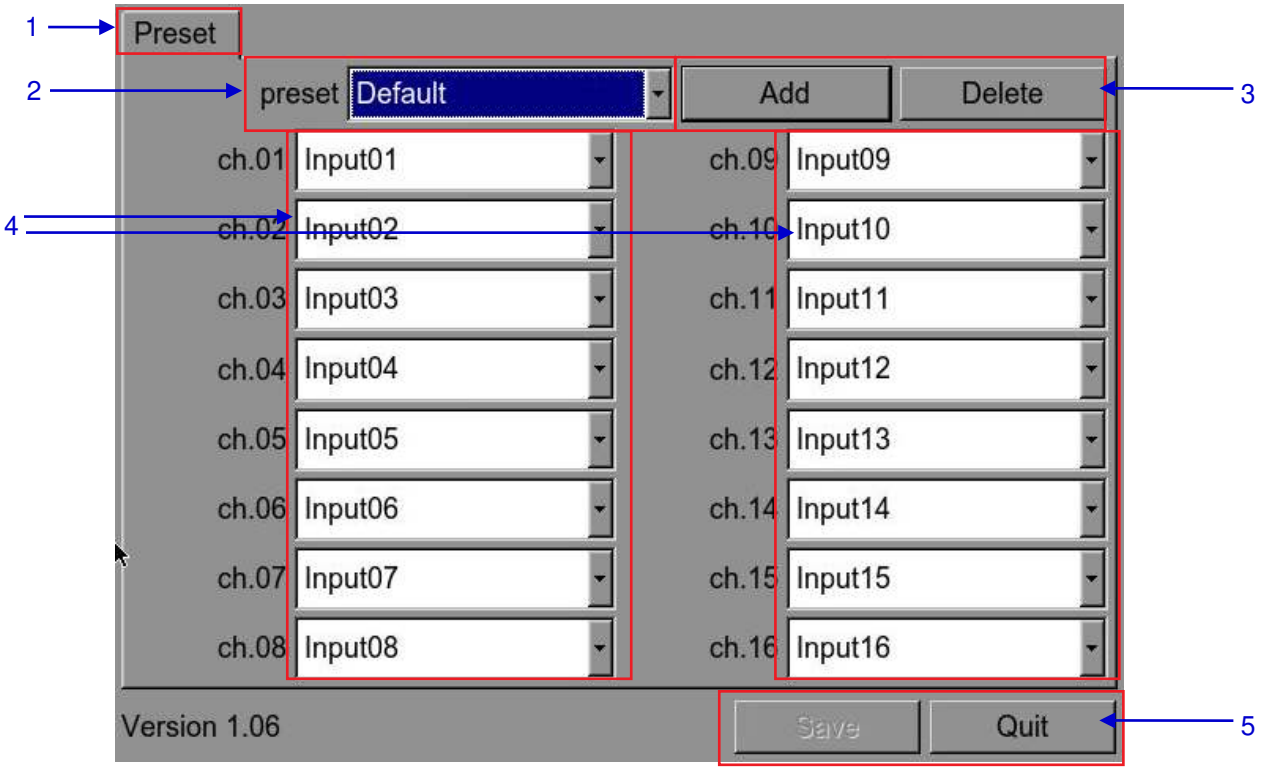


Figure 14 Audio Preset

1	Audio channel output presets can be configured in this tab.
2	Select a preset to view or change preset settings
3	Add a new preset, or delete the current preset.
4	Audio configuration for an audio preset can be changed here.
5	Click 'Save' to save current audio configuration to the selected preset. Click 'Quit' to return to Audio Channel Mapping configuration.

2.3.4.5. Closed Captions

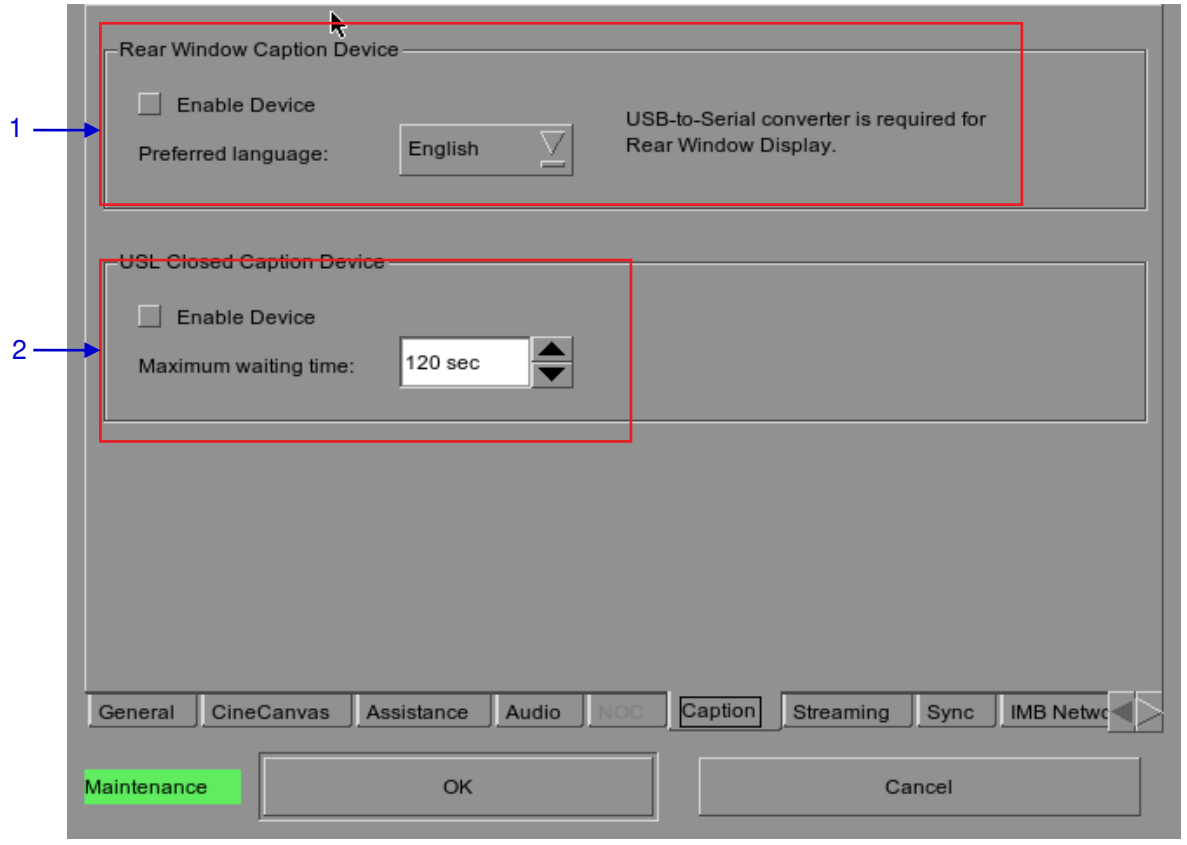


Figure 15 Closed Captions

1	[Rear Window Caption Device]	Enable and configures a Rear Window display for closed captions. *Note: A USB-to-Serial converter is required for Rear Window display.*
2	[Enable Device] [Maximum waiting time]	Enable communication with a closed caption device that supports SMPTE 430-10 (USL CCE-100, etc.). Specifies the maximum time to wait for the closed caption device to report it is ready, before starting playback.

2.3.4.6 IMB Network

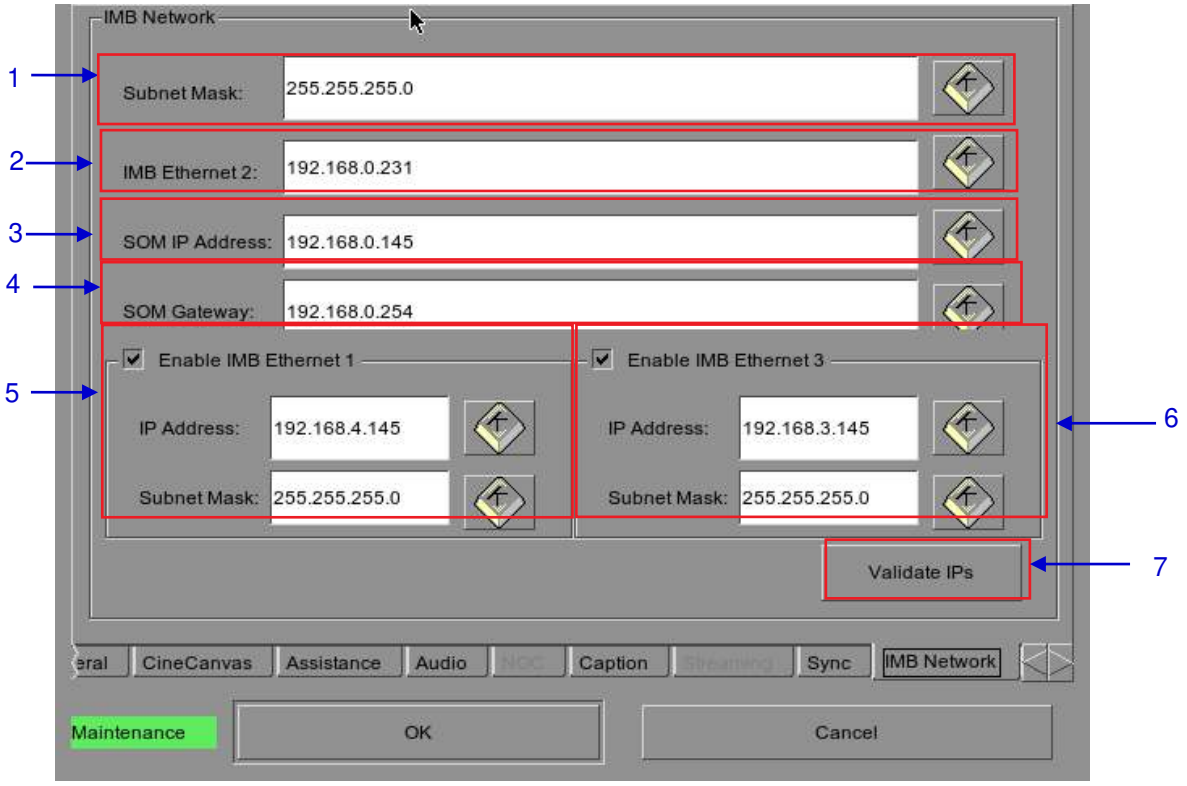
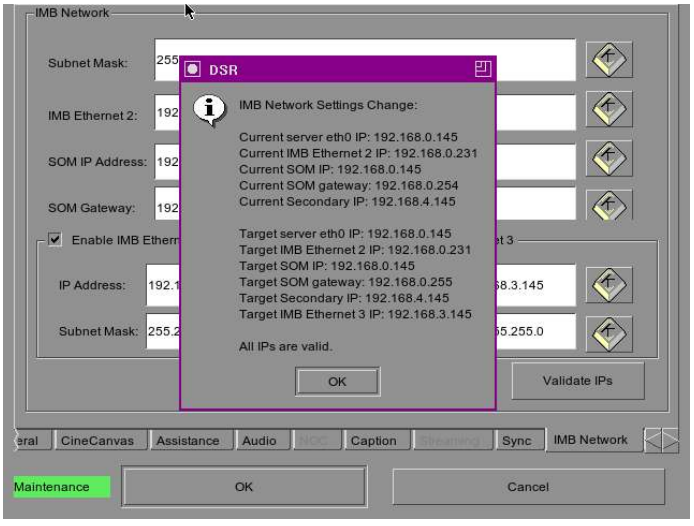


Figure 16 IMB Network.

1	Specify the subnet for all IP addresses.
2	Specify the IP address of the IMB. This is the IP address of the Security Manager.
3	This is the main IP address of the SX-4000. The SMS interface can be reached at this IP address using VNC.
4	Specify the network gateway for the SX-4000.
5	Specify an IP address and Subnet Mask for IMB Ethernet 1 of the SX-4000. This network access can be used for IMB sync and Dolby Atrmos connections.
6	Specify an IP address and Subnet Mask for IMB Ethernet 3 of the SX-4000. This network access can be used to connect to a content management network.

7	Click to check all IP addresses entered above for correctness. A dialog will be displayed showing the source and target IP addresses, and any errors found in the new network configuration as shown below.



2.3.4.7 IMB Storage

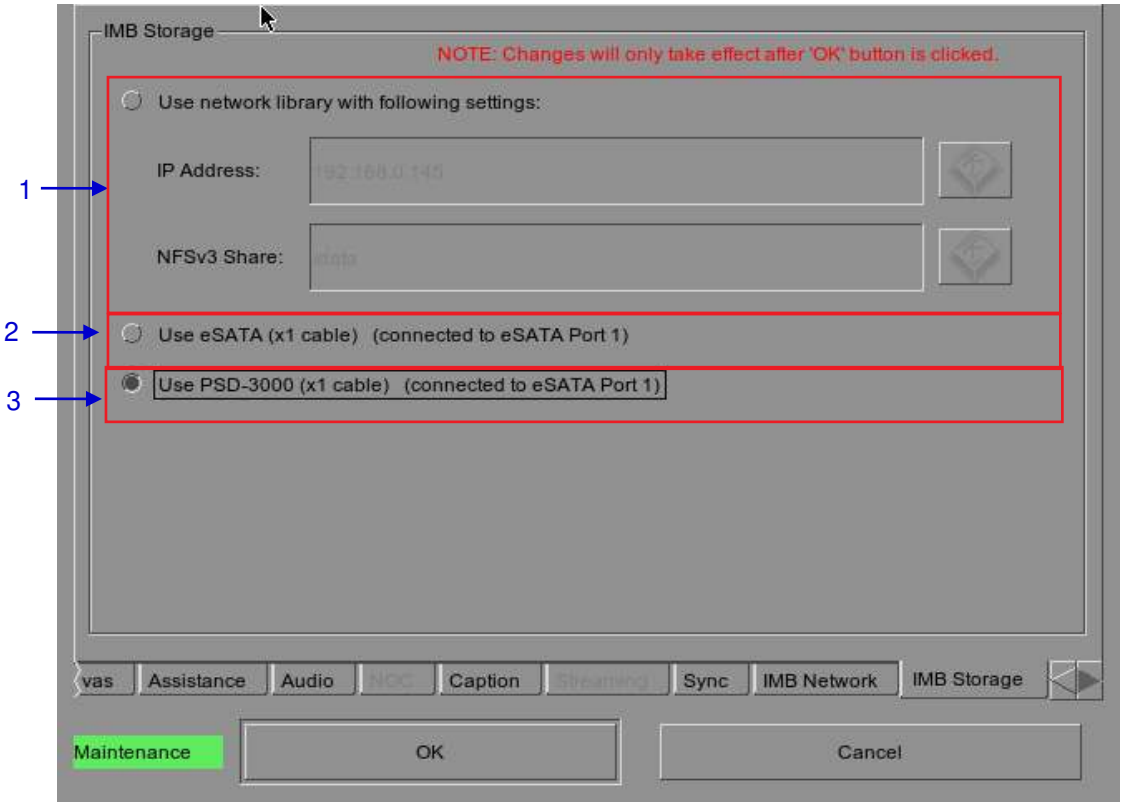


Figure 17 IMB Storage

1	Specify a Network-Attached Storage System (NAS) which has an NFS share available to this SX-4000 system for the use as data storage
2	Configure the SX-4000 to use an attached single external eSATA hard disk as data storage. The external eSATA hard disk must be attached to the eSATA Port 1 on the SX-4000.
3	Configure the SX-4000 to work with the Enterprise Storage. The Enterprise Storage must be attached to the eSATA Port 1 on the SX-4000.

2.3.5. SNMP Configuration

2.3.5.1. Introduction

The SNMP feature is an option on the SX-4000 that enables the use of SNMP to monitor the IMB. The SNMP interface contains many useful SNMP traps and is easy to configure.

2.3.5.2. Accessing the SNMP Configuration Interface

Press Configuration to switch the display from the SMS interface to the Configuration as seen in **Figure 18.**

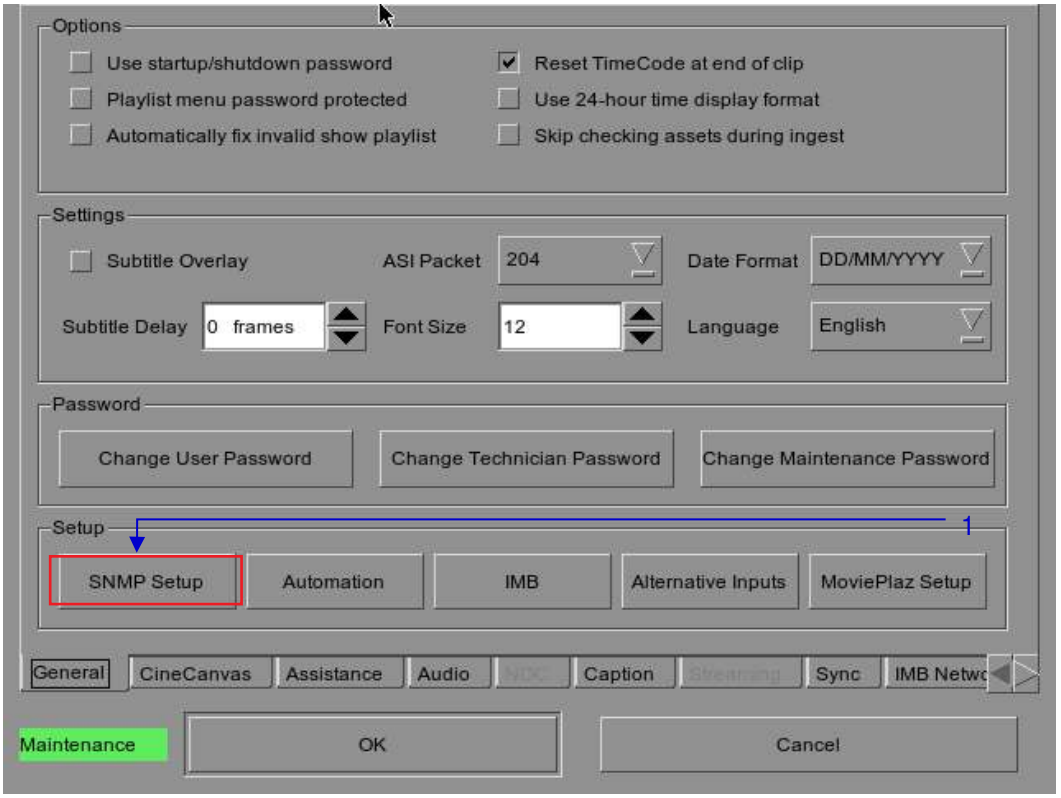


Figure 18 Configuration [General]

1	On the Configuration, select SNMP Setup. A new window appears as seen in **Figure 19**.

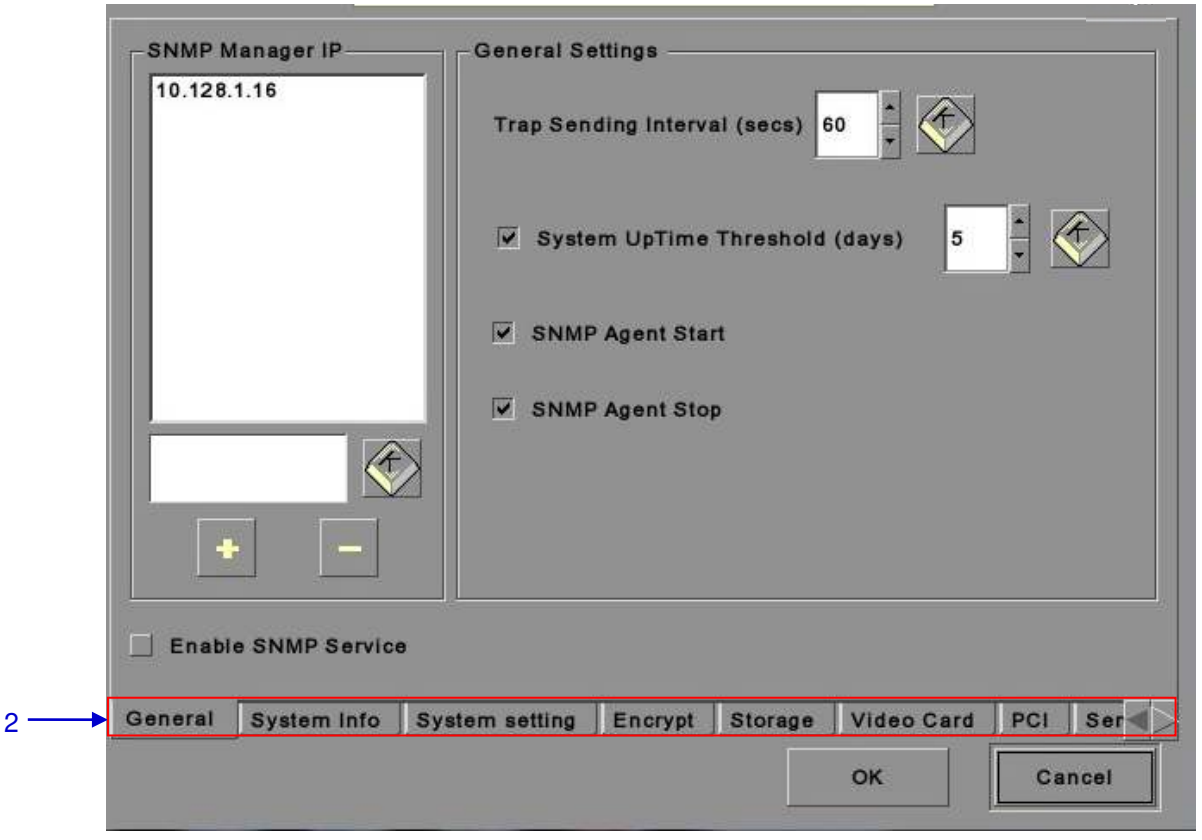


Figure 19 SNMP Configuration [General].

2	On the SNMP Configuration, there are several tabs along the bottom of the screen. The General option (shown in the above figure), System Info option, System Setting option, Encrypt option, Storage option, Video Card option, PCI option and Sensors option.

2.3.5.3. Understanding the SNMP Configuration Interface

2.3.5.3.1. General

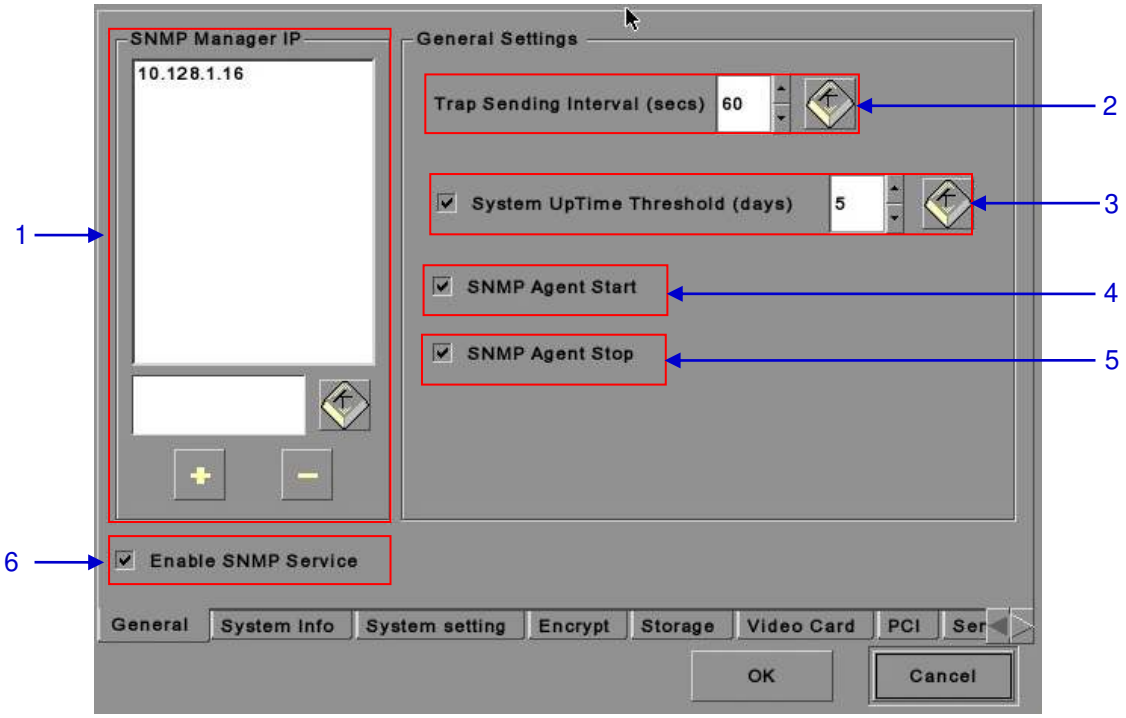


Figure 20 SNMP Configuration [General Settings].

1	For SNMP Manager IP Address, indicate the IP address of the SNMP Manager where traps are to be sent by typing in the IP Address, press the + or - button to insert multiple SNMP addresses.
2	For Trap Sending Interval, indicate the time interval in seconds after which a trap should be resent to the SNMP Manager. The trap will continue to be resent only as long as the error condition exists.
3	For System UpTime Threshold (days), indicate the threshold time in days. ***NOTE:*** *When Trap is On, a trap will be sent if the System UpTime exceeds the threshold value.*
4	Activate the Trap by checking the checkbox opposite SNMP Agent Start. ***NOTE:*** *When Trap is On, a trap is sent if the SNMP Agent is started.* Deactivate the Trap by un-checking the checkbox next to SNMP Agent Start.
5	Activate the Trap by checking the checkbox opposite SNMP Agent Stop. ***NOTE:*** *When Trap is On, a trap is sent if the SNMP Agent is stopped.* Deactivate the Trap by un-checking the checkbox next to SNMP Agent Stop.
6	Check on the checkbox to enable SNMP Service.

2.3.5.3.2. Storage

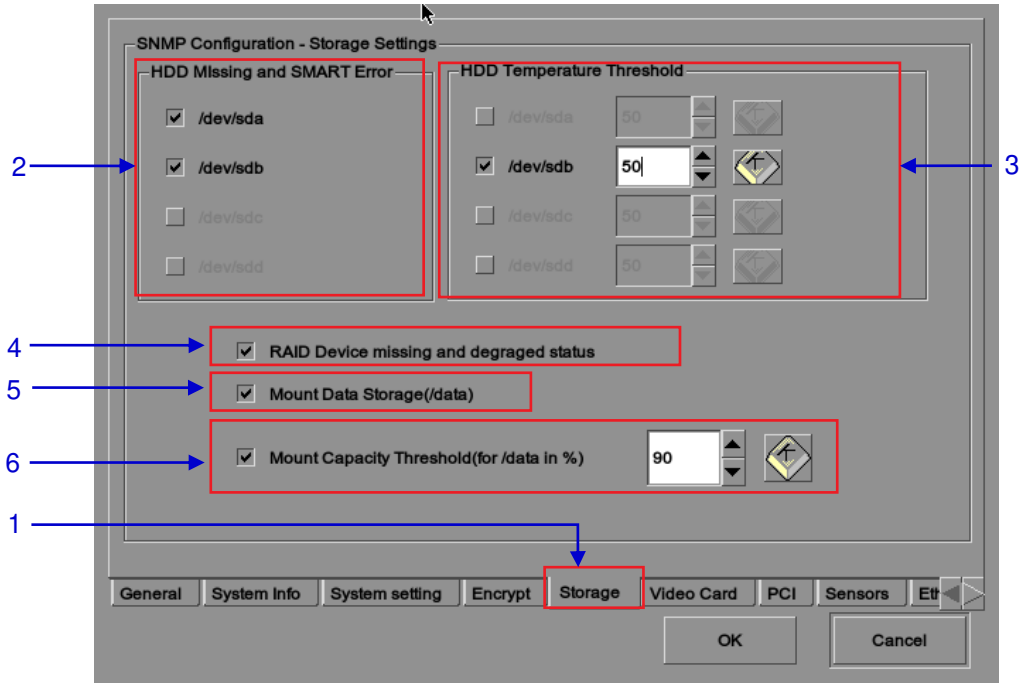


Figure 21 SNMP Configuration [Storage Settings]

1	On the SNMP Configuration, select Storage. A new window opens as seen in **Figure 21.**
2	Activate the Trap by checking the checkbox opposite the corresponding storage device. ***NOTE:*** *When the Trap is On, a trap will be sent to the SNMP Manager if the system cannot detect the specified device.*
3	Set the desired threshold temperature for respective storage device by using the [▲] and [▼] buttons. Activate the Trap by checking the checkbox opposite the corresponding storage device. ***NOTE:*** *When the Trap is On, a trap will be sent to the SNMP Manager when the threshold temperature is reached.*
4	Activate the Trap by checking the checkbox opposite RAID Device. ***NOTE:*** *When the Trap is On, a trap will be sent if the RAID Device is missing or degraded.*
5	Activate the Trap by checking the checkbox opposite Mount Data Storage. ***NOTE:*** *When the Trap is On, a trap will be sent if the data storage is not mounted on the system.*
6	Set the threshold mount capacity of the mount data storage by typing in the field or using the on-screen keyboard . Activate the Trap by checking the checkbox. ***NOTE:*** *When the Trap is On, a trap will be sent to the SNMP Manager if the mount capacity exceeds the threshold value.*

2.3.5.3.3. Video Card

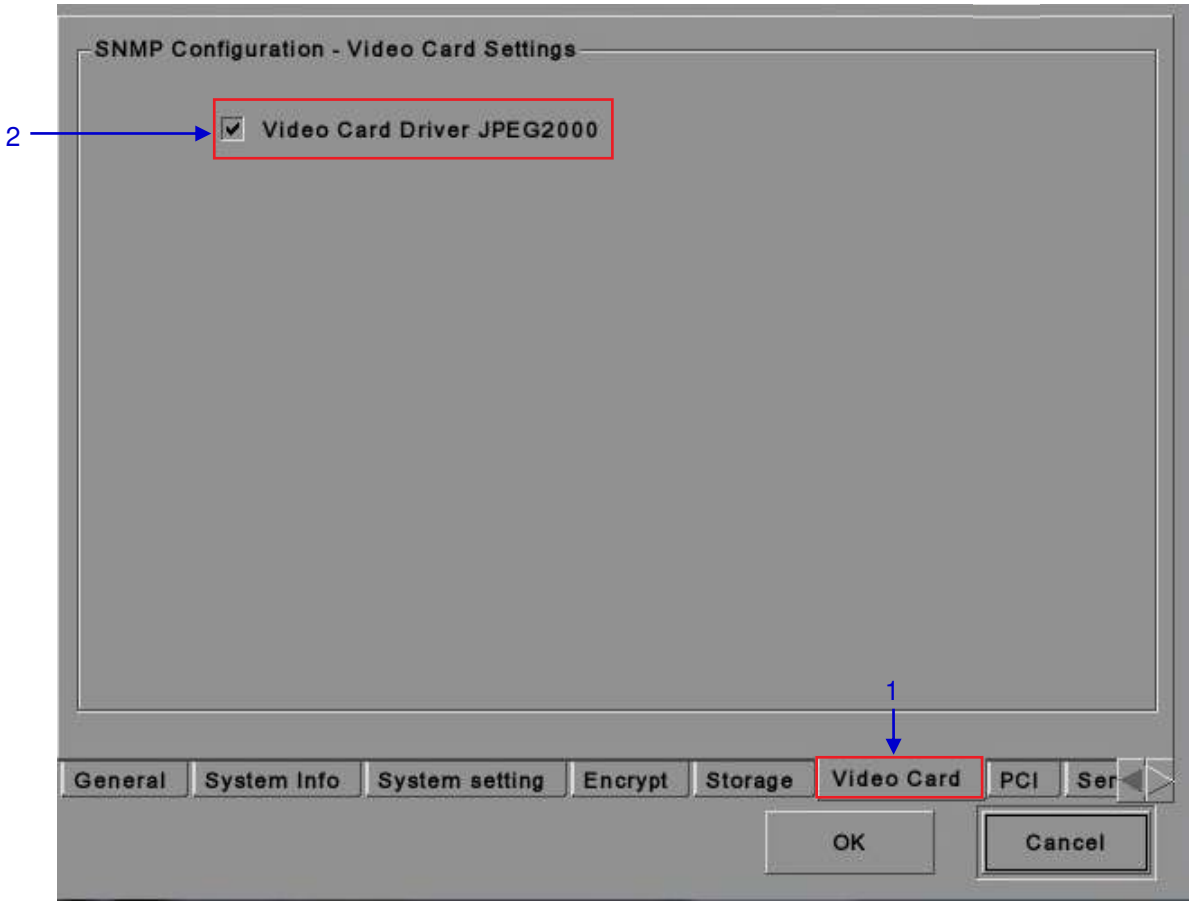


Figure 22 SNMP Configuration [Video Card Settings].

1	On the SNMP Configuration, select Video Card. A new window opens as seen in **Figure 22** above.
2	Activate the Trap by checking the checkbox opposite Video Card Driver JPEG2000. ***NOTE:*** *When the Trap is On, a trap is sent to the SNMP Manager when the video card driver is not loaded.*

2.3.5.3.4. PCI

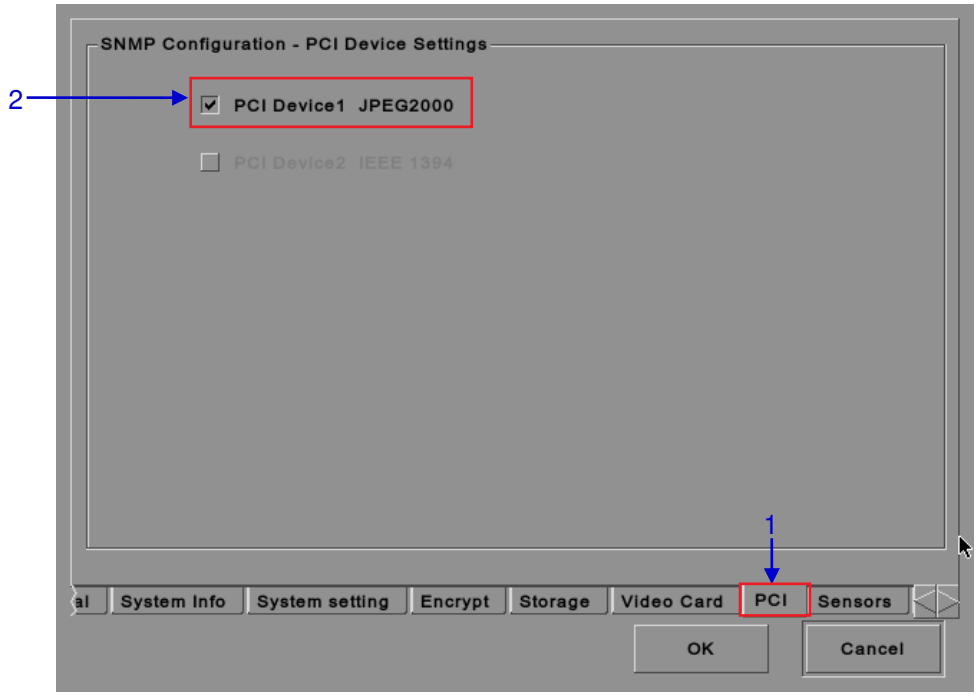


Figure 23 SNMP Configuration [PCI].

1	On the SNMP Configuration, select PCI. A new window opens as seen in **Figure 23** above.
2	Activate the Trap by checking the checkbox opposite the corresponding PCI Device. ***NOTE:*** *When the Trap is On, a trap is sent when the corresponding PCI device is missing.*

2.3.5.3.5. Sensors

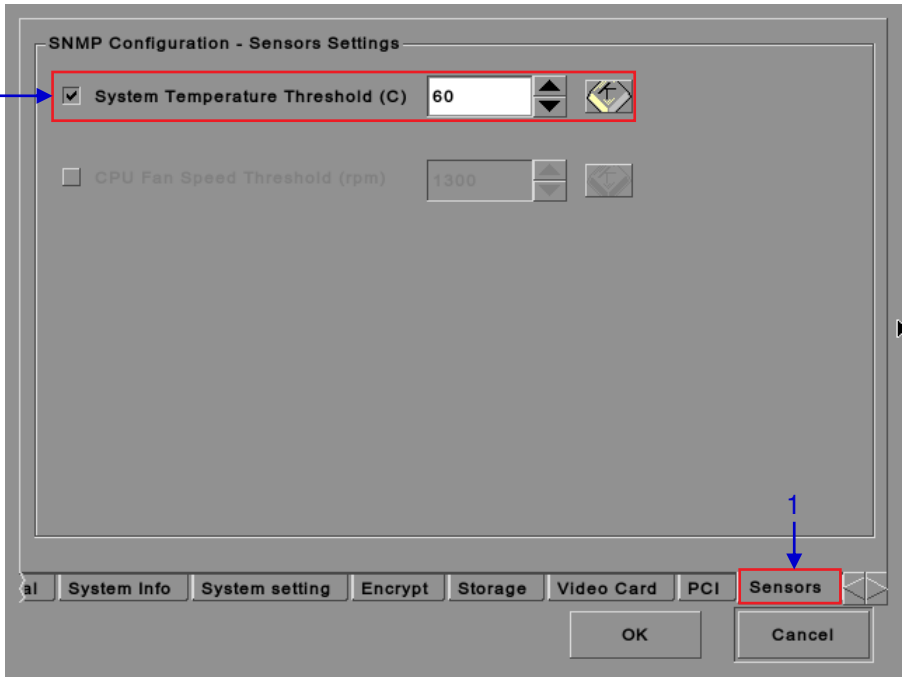


Figure 24 SNMP Configuration [Sensors].

1	On the SNMP Configuration, select Sensors. A new window opens as seen in **Figure 24** above.
2	Set the threshold temperature required for the system sensors by typing in the field or using an on-screen keyboard . Activate the Trap by checking the checkbox opposite System Temperature Threshold. ***NOTE:*** *When the Trap is On, a trap is sent if the system temperature exceeds the maximum threshold temperature.*

2.3.5.3.6. Ethernet

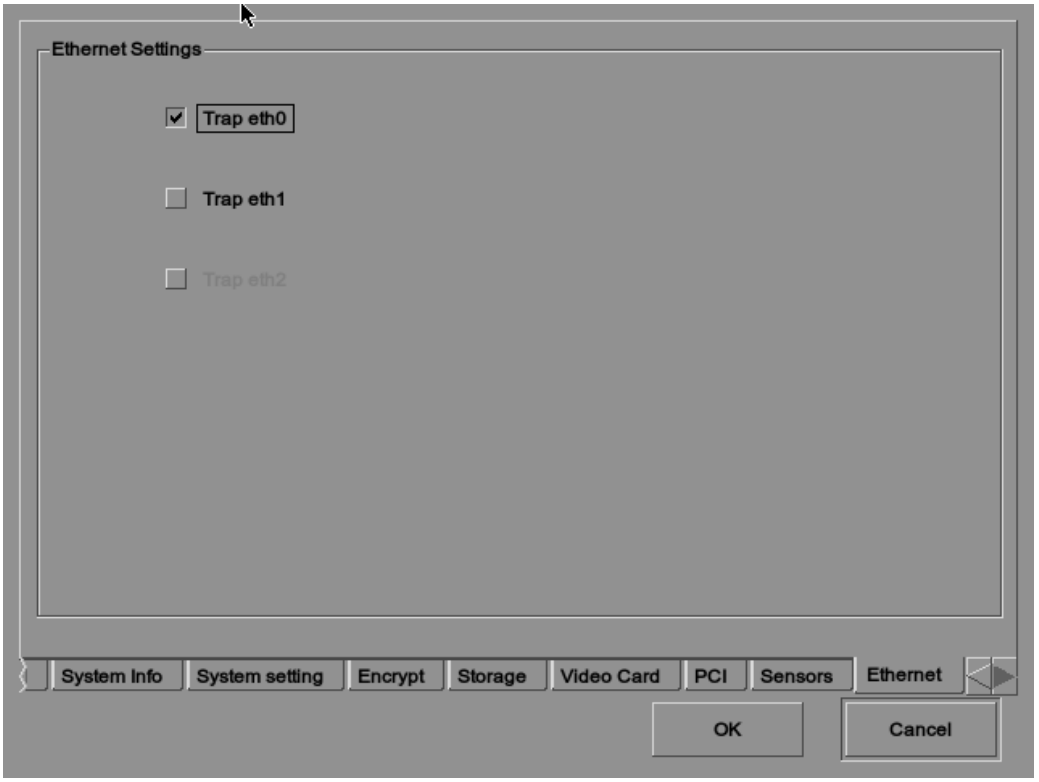


Figure 25 Ethernet settings.

1	Enables sending an SNMP trap if the system detects that the selected network interface is down.

2.3.5.3.7. Restart/Save/Cancel

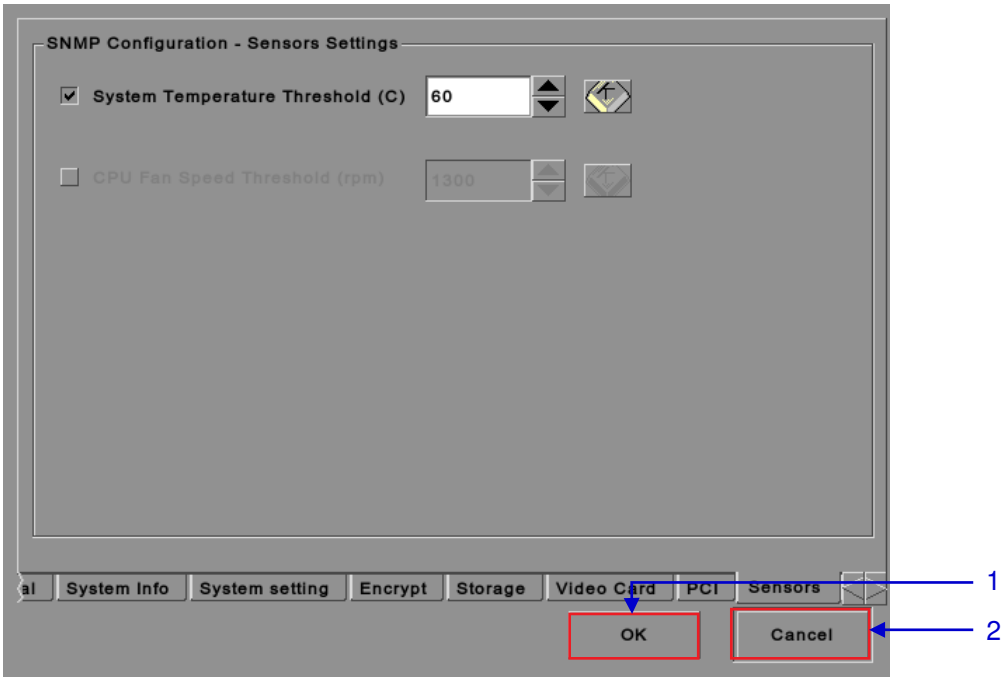
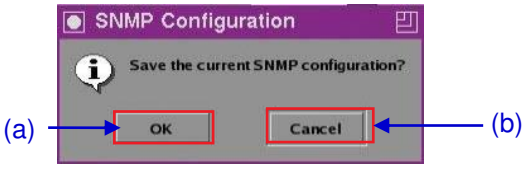
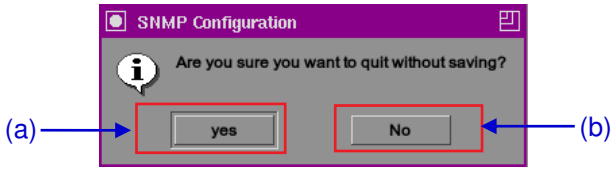


Figure 26 Pop-up window for restarting SNMP service.

1	After the settings are complete, press OK to confirm. A small window pops out asking if you want to save the current SNMP configuration.  (a) Select OK to save the configuration. (b) Select Cancel to cancel the configuration.
2	Press Cancel if you want to cancel the operation. A small window pops out to confirm if you want to quit without saving.  (a) Select Yes if you want to confirm. (b) Press No if you want to cancel the operation.

2.3.6. Automation

Please refer to **Figure 6** to transit from Configuration to Automation.

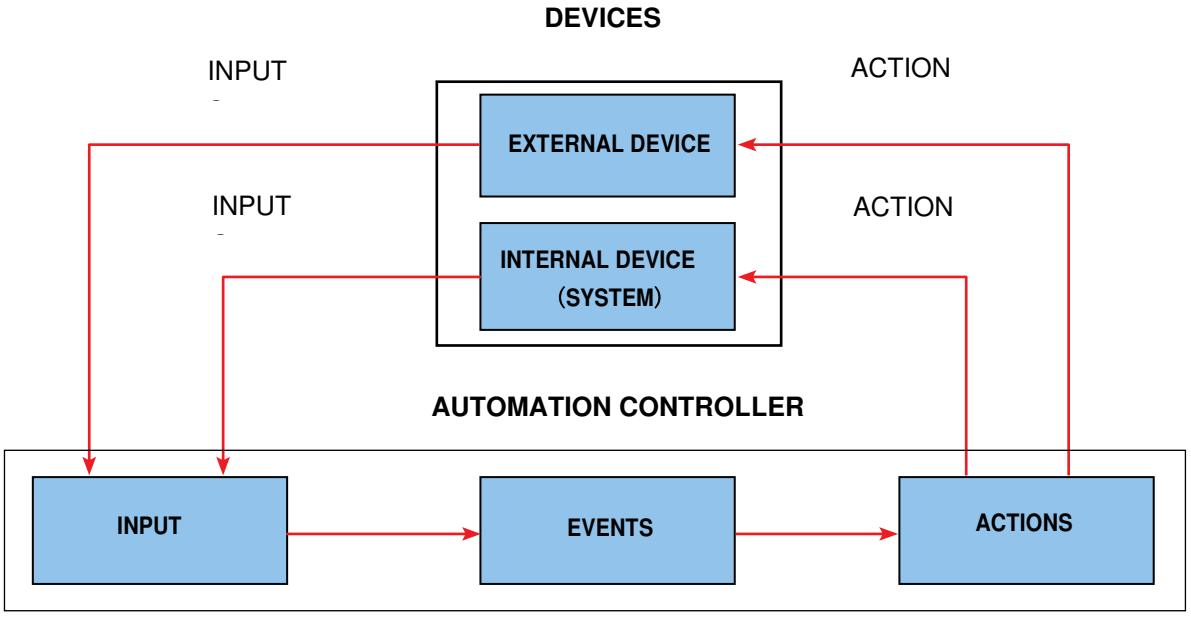


Figure 27 Automation flowchart.

2.3.6.1. Devices

Automation Device Setup

It should be noted that automation will only be executed within a playlist as long as that playlist is playing. If playback stops or the Stop button is pushed automation will not run. For Series 2 projectors please refer to Section 2.8.

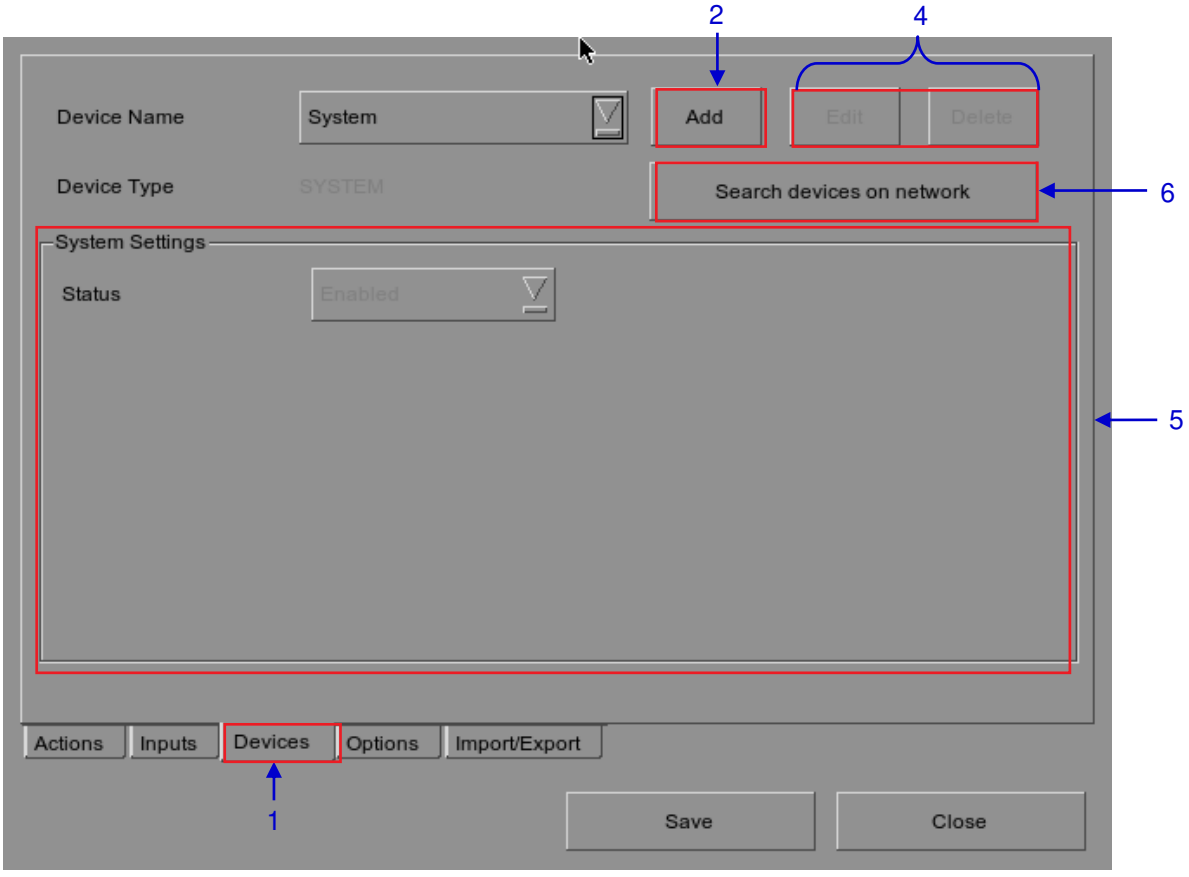


Figure 28 Devices.

1	On the Automation, press Devices. A new window opens as seen in **Figure 28**. In the Devices, the System is the default device name. The System device is the IMB from which all received commands will be forwarded to the sub-systems in the IMB. (Continued on next page)

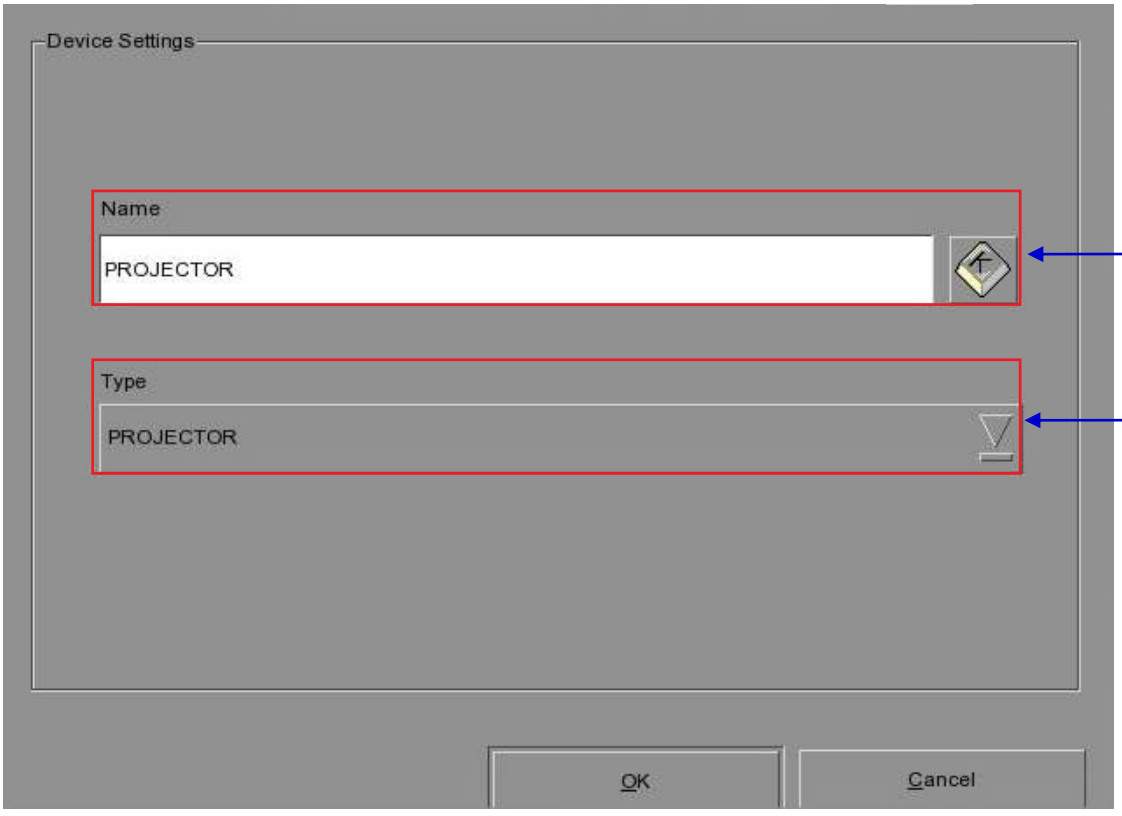
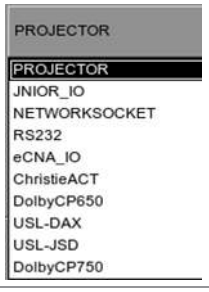


Figure 29 The device configuration window.

2	To add a new device, press Add. A new window appears as seen in **Figure 29**. Type in the name you want to assign to a particular device.
3	After adding the device name, assign the type of device you want to use. Select from a dropdown list as seen below. 
4	You can edit or delete the device name on the dropdown list in the Devices (Please refer to **Figure 28**). The device configuration window as seen in **Figure 29** opens when you press Edit to edit the existing device name. The device name is deleted immediately after pressing Delete.

5	Under Projector Settings, (a) When the selected device type is PROJECTOR, select the model of the projector you want to use from a dropdown list. When the selected device type is JNIOR_IO, only one model of the Ethernet I/O controller is available from the dropdown list. (b) Set the parameters such as IP address, Port and Status of the selected device, Login name and Password. Use the on-screen keyboard to type in the IP address, Port, Login name and Password. (c) The status of the device can be Enabled or Disabled. Select from the dropdown list as seen below. ***NOTE:*** *This is the only option available for Projector Settings when System or GPIO is selected.*
6	To search click the Search Devices on Network button. This will scan the network for available devices. Once discovered, to select the device and press Add.

2.3.6.2. Inputs

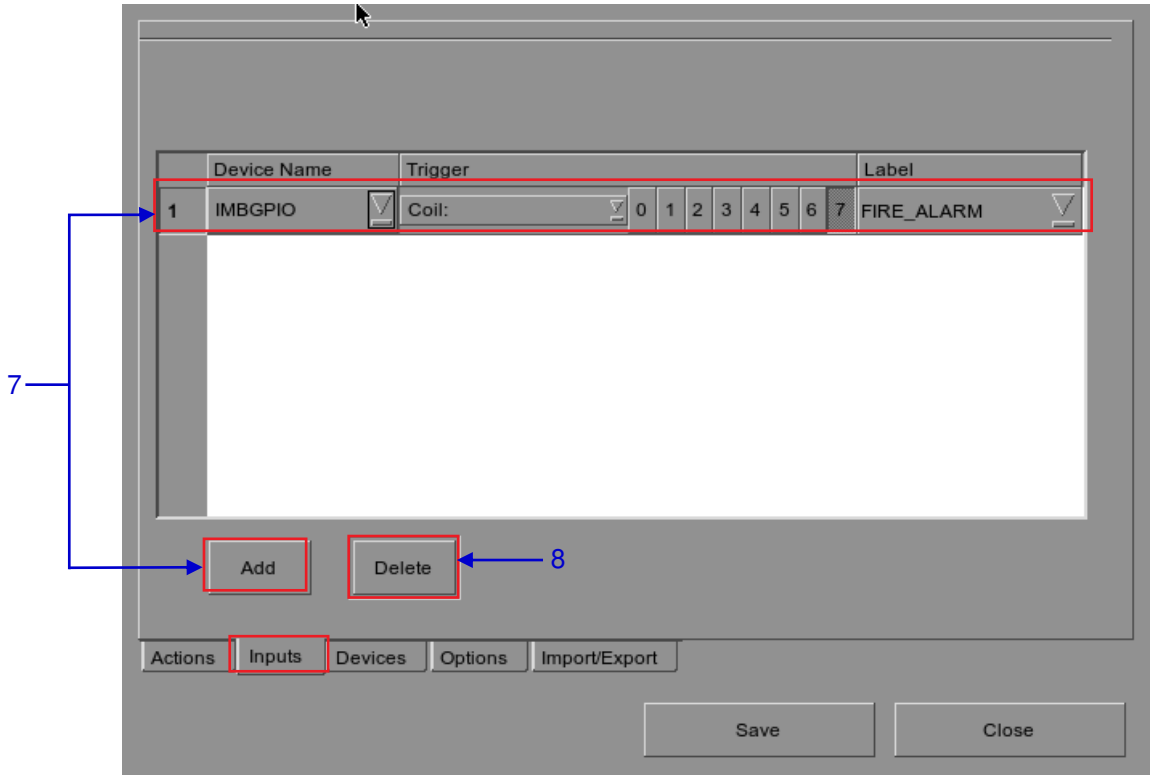


Figure 30 Inputs.

7	Press the Inputs button. A new window opens as seen in **Figure 30**. On the Inputs, press Add to enter the selected device. ***NOTE:*** *Only devices capable of sending a signal to the IMB can be added under Inputs.* (a) Select a Trigger number from 0-7. Only one trigger can be selected at a time. (b) Select an event label from the dropdown list. See the Actions.
8	Press Delete if you want to delete the selected input.

2.3.6.3. Actions

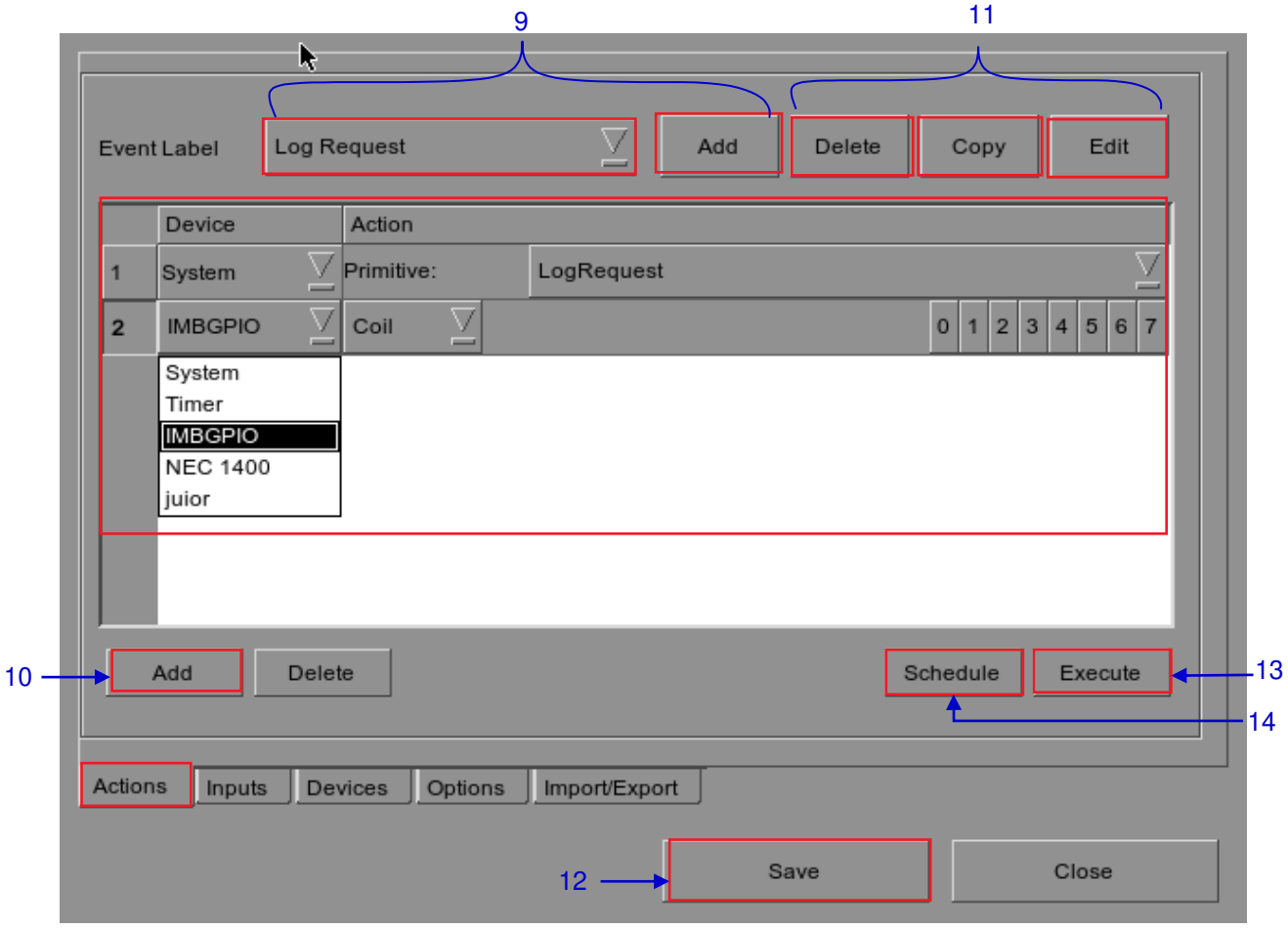
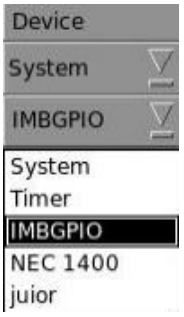


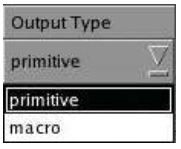
Figure 31 Actions

9	Select Actions on the Automation. On the Actions, press Add, located at the top portion of the screen. An on-screen keyboard opens. Type in your desired label name and press Enter.
10	Press Add, located at the lower portion the screen, to append an action to the selected Event Label. Then select a device from the dropdown list as seen below. New devices can be added to the list from the Devices . 

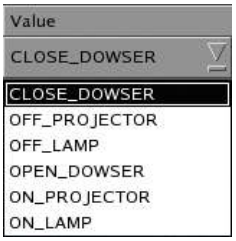
(a) If the selected device is System, the Output Type prompt is Primitive. The Pins To Use option is disabled.

Then select the desired operation under the Value option.

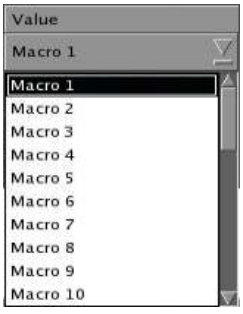
(b) If the selected device type is a Projector, select *primitive* or *macro* from a dropdown list under the Output Type column.



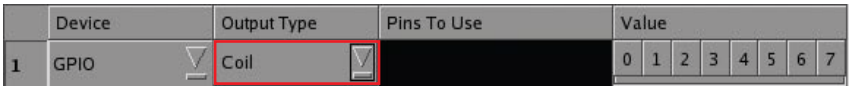
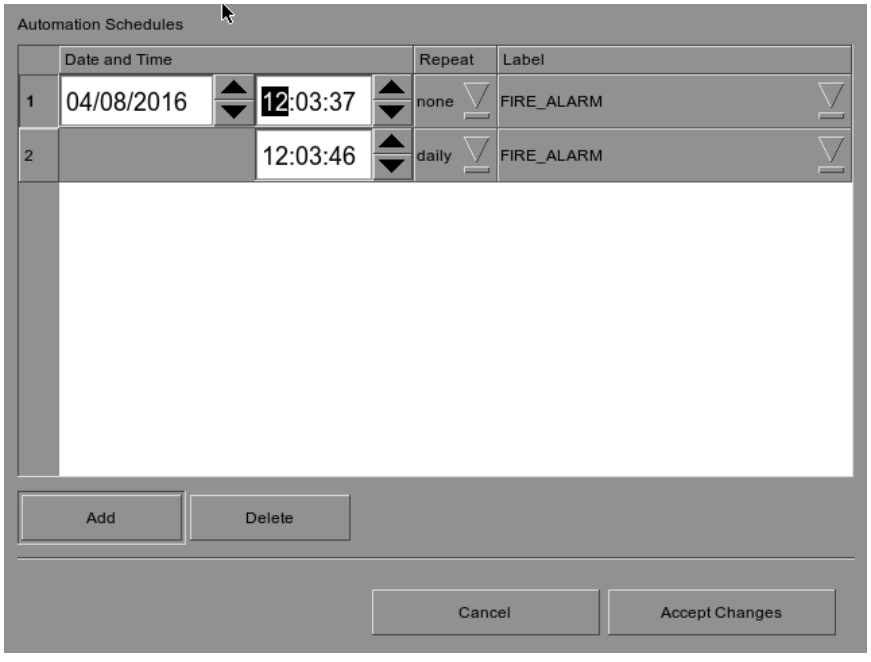
[1] If *primitive* is selected, the Value option will show a dropdown list of different projector options. Select the desired projector option.



[2] If *macro* is selected, the Value option will show a dropdown list of Macro 1-32. Select the desired number of Macro from 1-32.



(c) If the device type is juior or IMBGPIO, select *Coil, Register* or *Level* from a dropdown list under the Output Type column.

	If *Register* is selected, multiple pins can be selected under the Pins To Use option. The number of pins selected will be the number of pins that can be used for output under the Value option. You can select more than one pin in the Value column based on the selected pins in the Pins To Use option. If Coil is selected, only one pin can be selected at a time. The Pins To Use option is disabled. The pins can be selected directly under the Value option. 
11	To edit an existing label's name, select the label from the dropdown list and then press Edit. An on-screen keyboard opens. Edit the existing label name and press Enter. To use an existing label to copy to another label, select the label to be copied from the dropdown list and then press Copy. Then enter a new label name for the newly copied label. To delete an existing label, select the label name from the dropdown list and then press Delete.
12	Press Save after completing the settings to return to the Playlist Management.
13	By pressing the Execute button you can test if an automation command is working correctly. This button will trigger the event selected.
14	Automation for events can be scheduled. To access the automation schedule, select the [Schedule] button. This will bring you to a setup screen.  To add an Automation Schedule, select the [Add] button. Select the repeat interval, options are either daily or a single occurrence.

2.4. Show Playlist

2.4.1. Create a Show Playlist

2.4.1.1. Access to Playlist Management

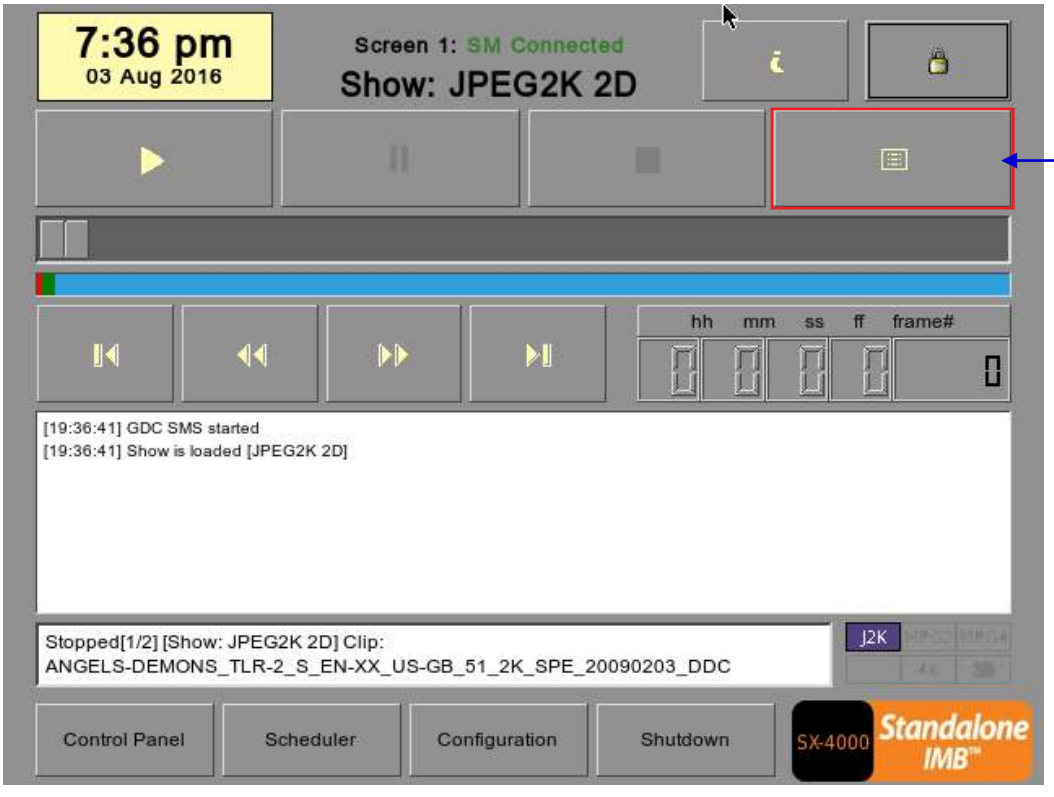


Figure 32 Creating a show playlist.

1	On the **SMS** interface, press [ ] to open a Playlist Management for creating playlists as seen in **Figure 33** below in ***Section 2.4.1.2. Creating a Playlist***.

2.4.1.2. Creating a Playlist

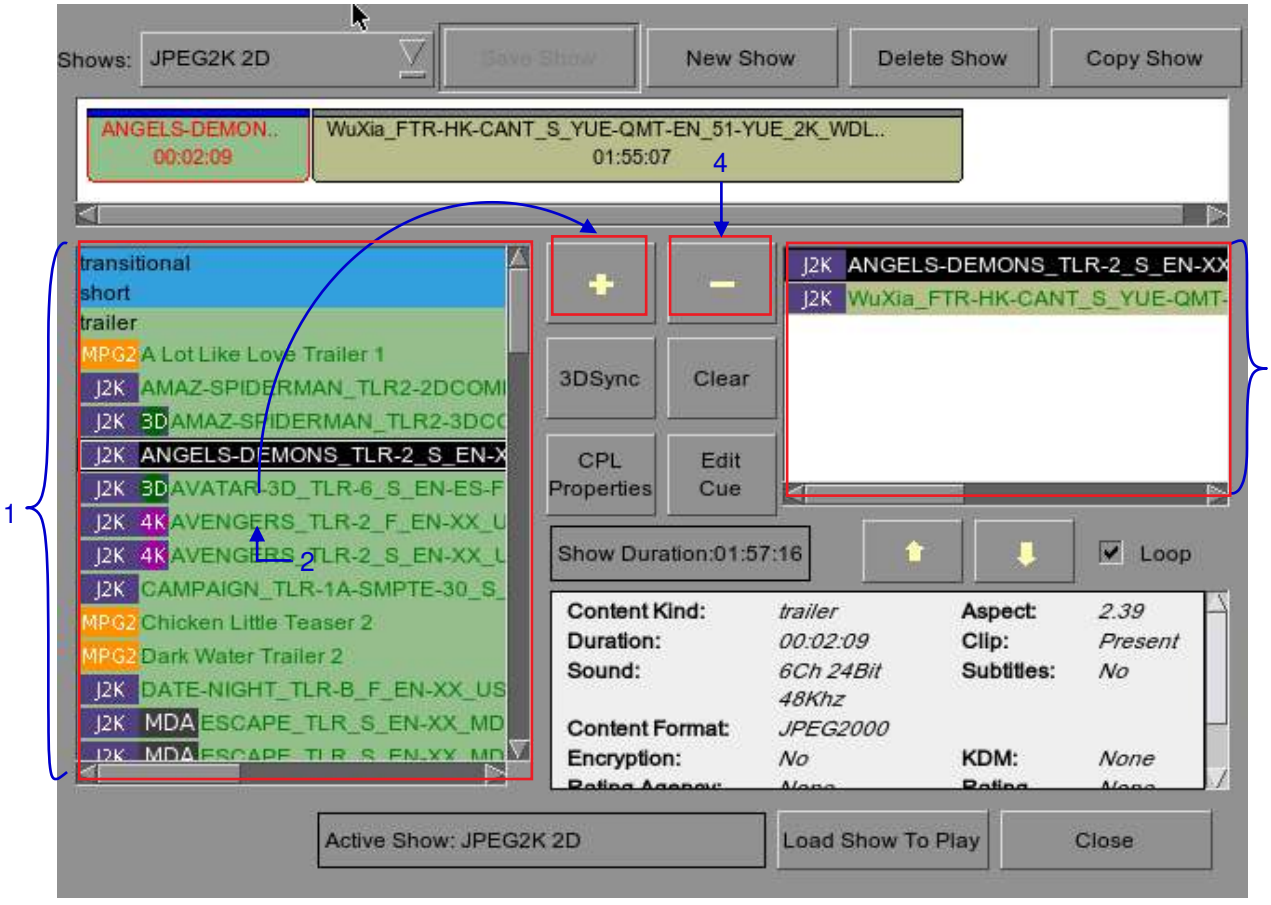


Figure 33 Playlist Management

1	On the Playlist Management, all compositions stored are listed in the Content column on the left. The content is shown in alphabetical order grouped by type [Trailer, Feature, etc.]. Available automation cues are listed under 'cues'.
2	Select the composition to add to the playlist and press [+]. Repeat the same step to add other compositions (e.g. trailers or advertisements) to the playlist.
3	Compositions in the playlist are shown in the Playlist column on the right. Use [⬆] (move up) and [⬇] (move down) to change the order of compositions in the playlist. The order of the compositions in the playlist may also be changed by dragging their icons in the timeline display.
4	You can remove compositions from the Playlist column by selecting the clip that you want to remove and pressing [-].

2.4.1.3. Editing Cues

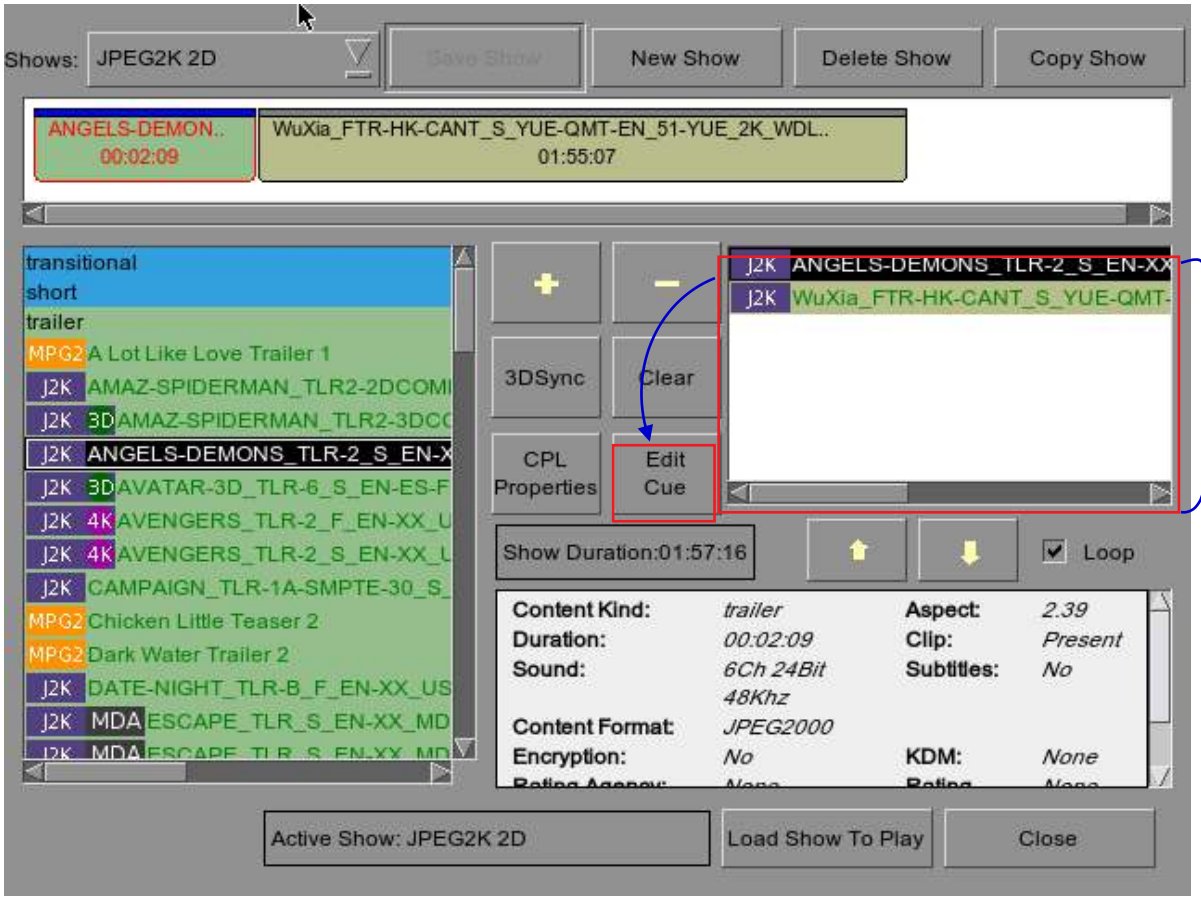


Figure 34 Playlist Management

1	To edit a cue of a composition on the playlist, select the desired composition from the Playlist Management and press Edit Cue. A new window displaying the Edit Cue opens as seen in **Figure 35**.

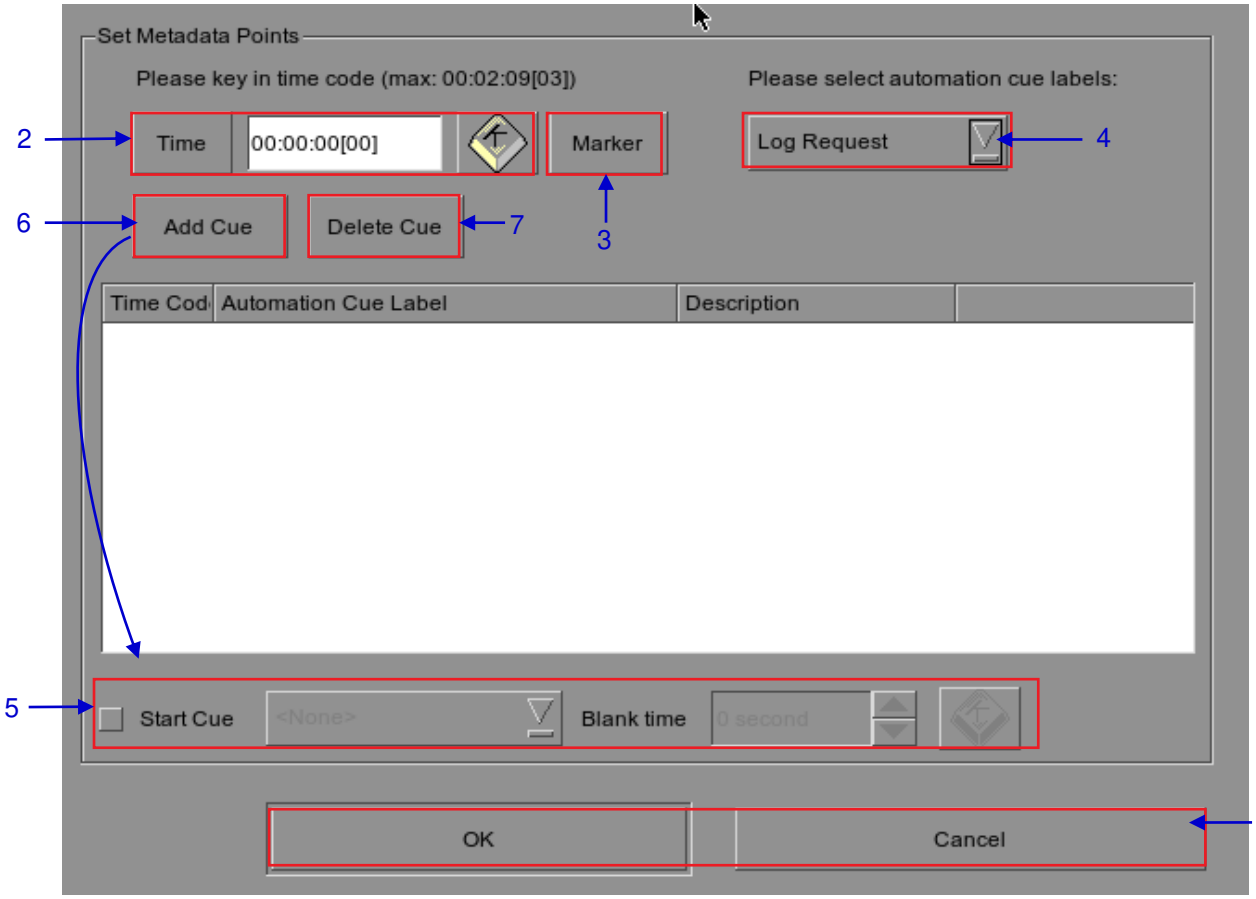
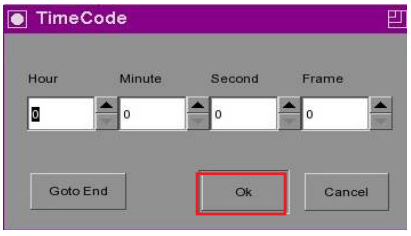
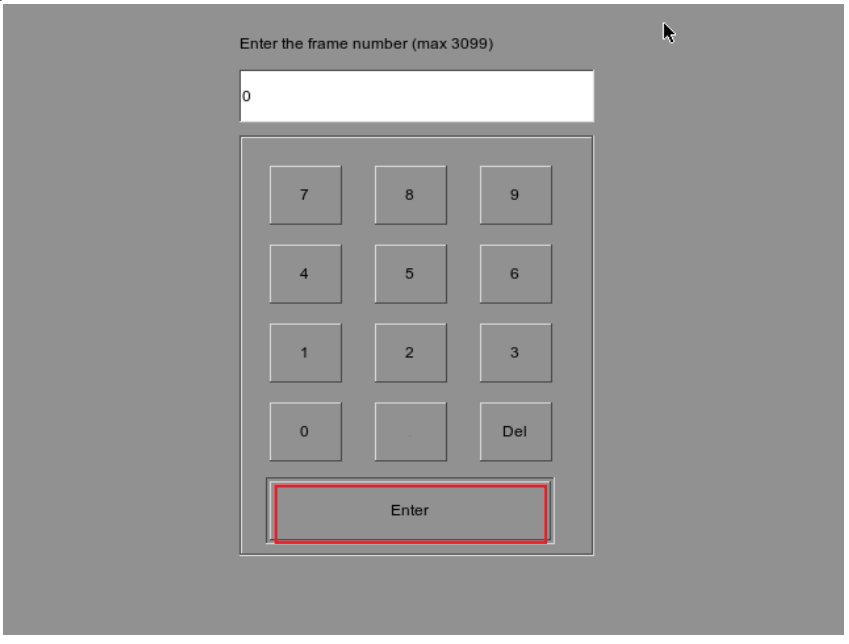
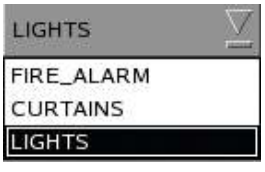


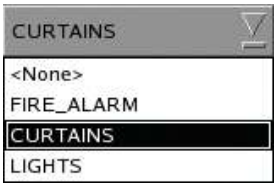
Figure 35 Edit Cue

2	To specify a time code for the activation of the cue, press and a time code entry window will open. Use the [▲] and [▼] buttons enter the desired time code. Press OK to confirm your selection.  To specify a frame for the activation of the cue, press the Time button once and it will toggle to display the Frame button as shown below.

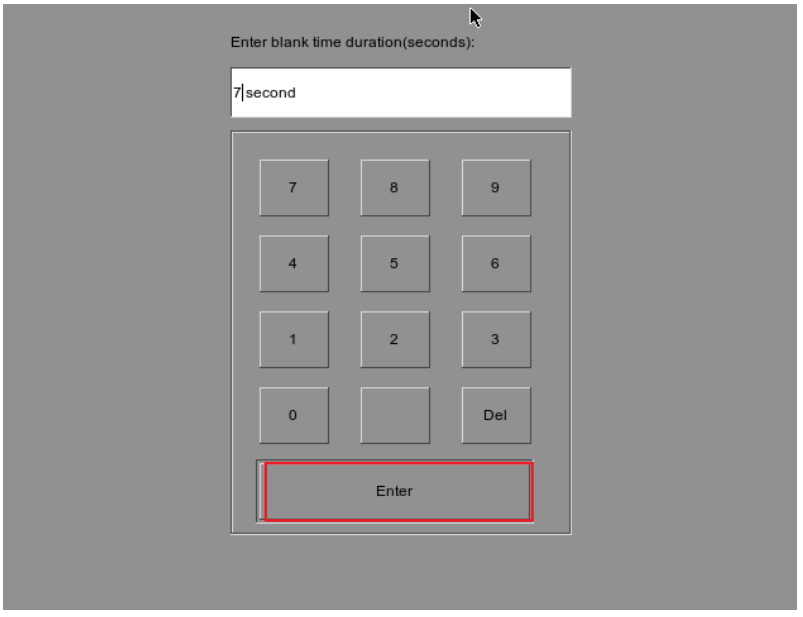
	Press and a frame number entry window will open. Key in the desired frame number and press Enter. 
3	Press Marker to view any markers present in the composition. If the composition does not contain any markers, a small window pops up to indicate that there are no markers present.
4	To add an automation cue label, select the desired automation cue label from the dropdown list as seen below. 

5

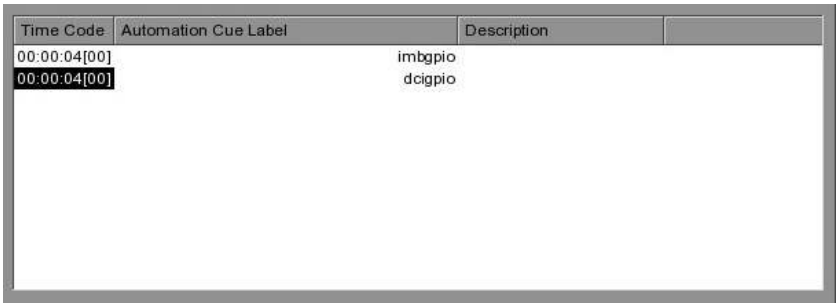
To add a start cue, tick the Start Cue option and select the desired automation cue label from the dropdown list as seen below.



To specify the blank time, press and a blank time entry window will open. Key in the desired blank time and press Enter.



NOTE: *A start cue is activated immediately before the composition plays. The blank time indicates the time interval between the end of the start cue and the start of the composition's playback.*

6	Press Add Cue to add the cue to the composition. The cue's details will then be displayed in the cue window as seen below  ***NOTE:*** *You can select a cue from the cue window at any time to edit its properties.*
7	To delete a cue from the composition, select the cue from the cue window and press Delete Cue.
8	To save the changes and exit, press OK. To exit without saving any changes, press Cancel.

2.4.1.4. Saving the Playlist

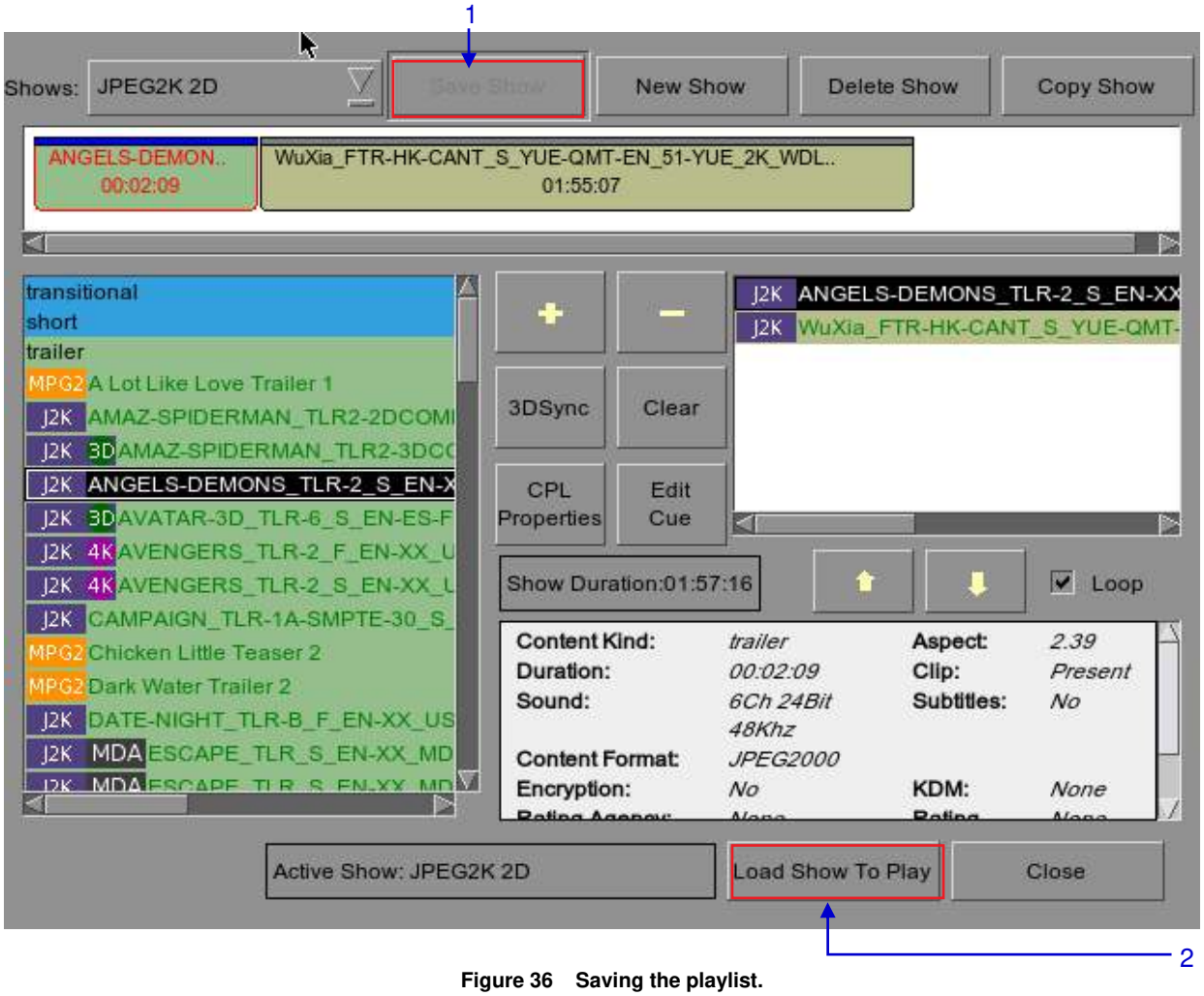


Figure 36 Saving the playlist.

1	Press Save Show to save the playlist. This ensures any changes to playlist will not be lost.
2	Press Load Show to Play and return to the SMS Interface.

2.5. Show Schedule

2.5.1. Schedule a Show

Figure 37 SMS Interface [Scheduler].

1	On the SMS Interface, press Scheduler. A new window opens as seen in **Figure 38**.

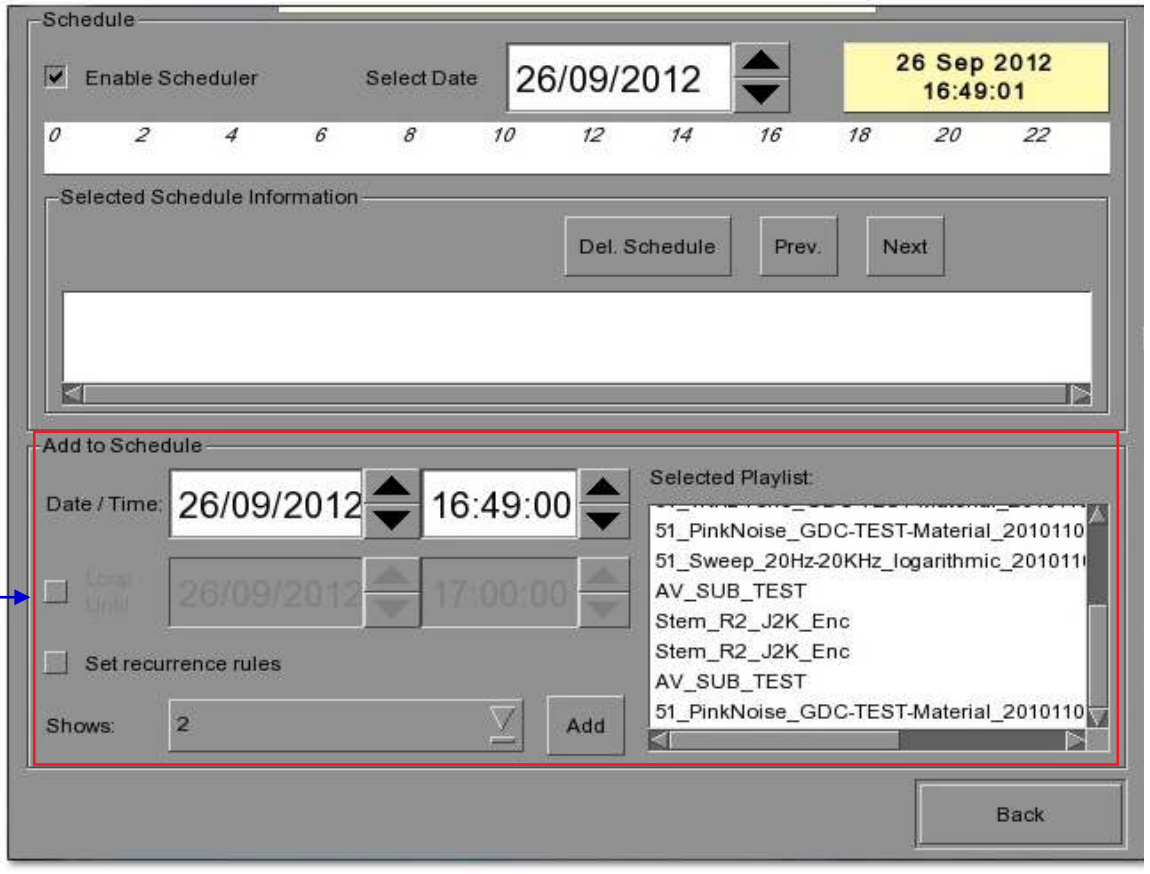


Figure 38 Scheduler

2	Go to the bottom section named Add to Schedule. At Date / Time, indicate the date and time to schedule the show. (a) The date format is DD/MM/YYYY and the time format is HH: MM: SS. To select the day, click on DD and adjust to the required day using [▲] and [▼]. Repeat the same for MM, YYYY, HH, MM and SS. (b) At Shows, select the playlist for the show. Press [▼] to view all the playlists already saved in the IMB. Select the required playlist.

(c) The Selected Playlist column on the right displays the clips in each playlist.

(d) If you want the playlist to loop for a period of time, check Loop Until and indicate the date and time to end the loop.

(e) Press Add after the schedule date/time is fixed and playlist is selected.

(f) If the new show schedule does not conflict with other schedules already saved to the IMB, the schedule will be added to the existing list of schedules in the IMB.

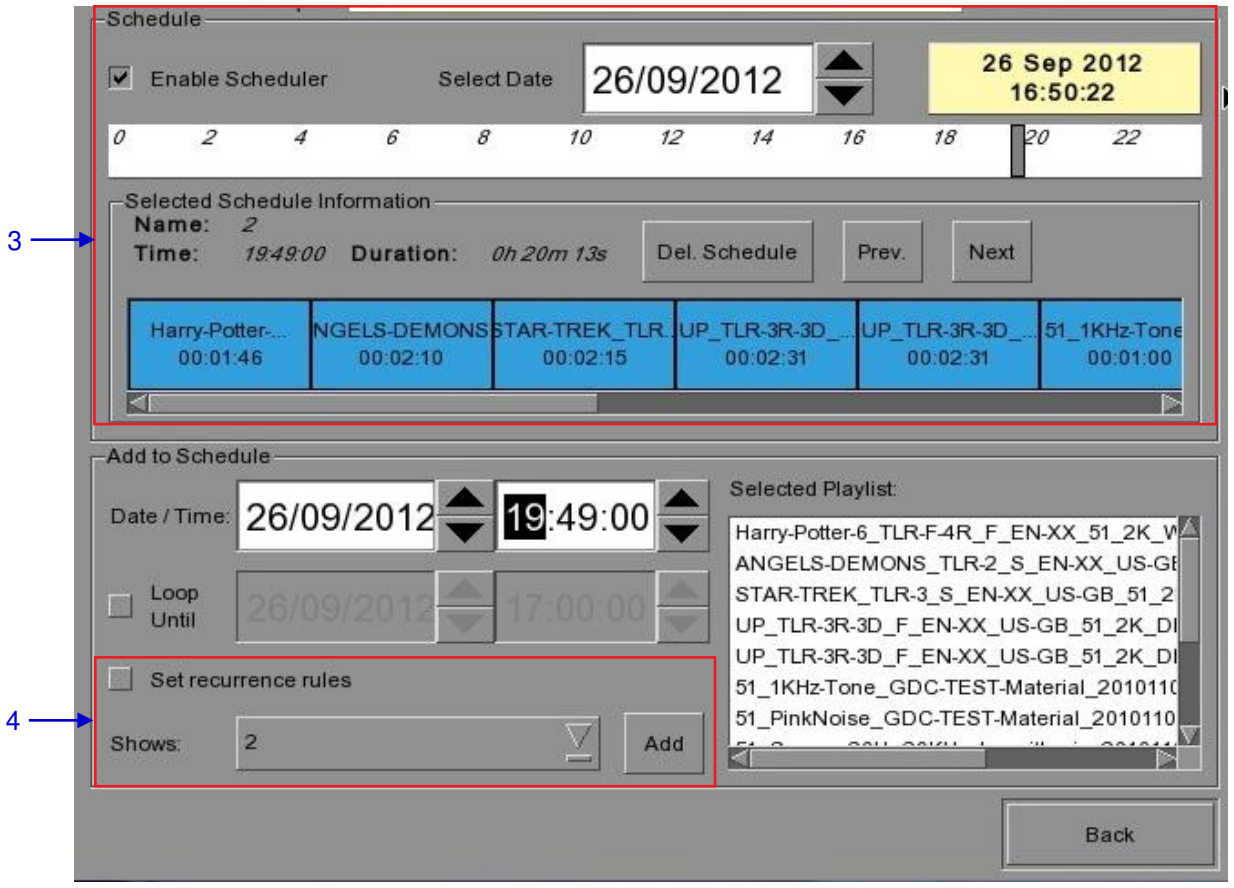
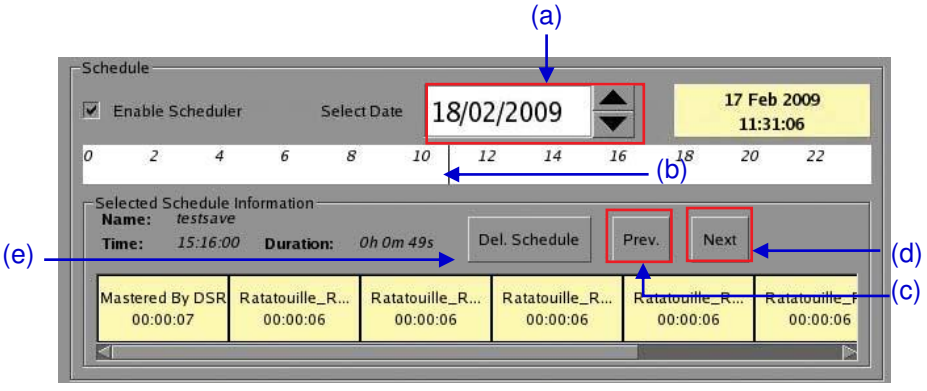


Figure 39 Viewing schedule information.

3	Check the Enable Scheduler checkbox to enable scheduled playback  (a) At Select Date, indicate the date of the schedule. You should see a line on the time-bar at the slot where the show is scheduled. (b) Click on the line. Information about the show such as name, time and duration will be displayed in the Selected Schedule Information column beneath the time-bar. (c) To navigate to the previously scheduled show just before the selected show, press [Prev]. (d) To navigate to the succeeding show scheduled after the selected show, press [Next]. (e) To delete a show schedule from the time-bar, just click on the relevant color bar and press [Del. Schedule].
4	To replicate the same show schedule on other days, check Set recurrence rules and press Add.

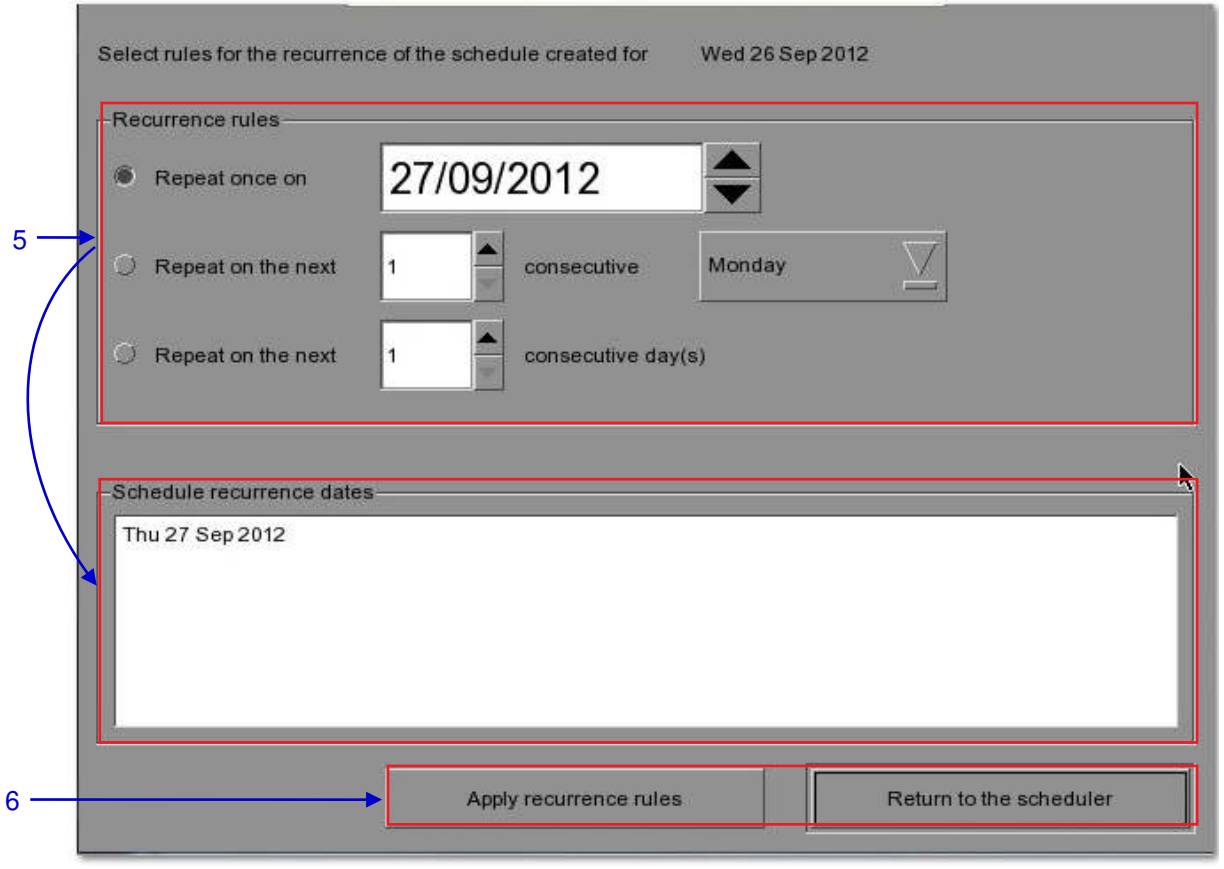


Figure 40 Replicating show schedule.

5	A new window opens as seen in **Figure 40**. Select the required recurrence option. Only one option can be selected. Upon selection, all effective recurring dates will be listed in the Schedule recurrence dates column at the bottom.
6	Press Apply recurrence rules to schedule the recurrence dates. If no option is selected, press Return to the scheduler to return to Scheduler. When on the Scheduler, press back to return to the SMS Interface.

2.6. Synchronizing Shows

2.6.1. Synchronizing Clips for 3D (MPEG2)

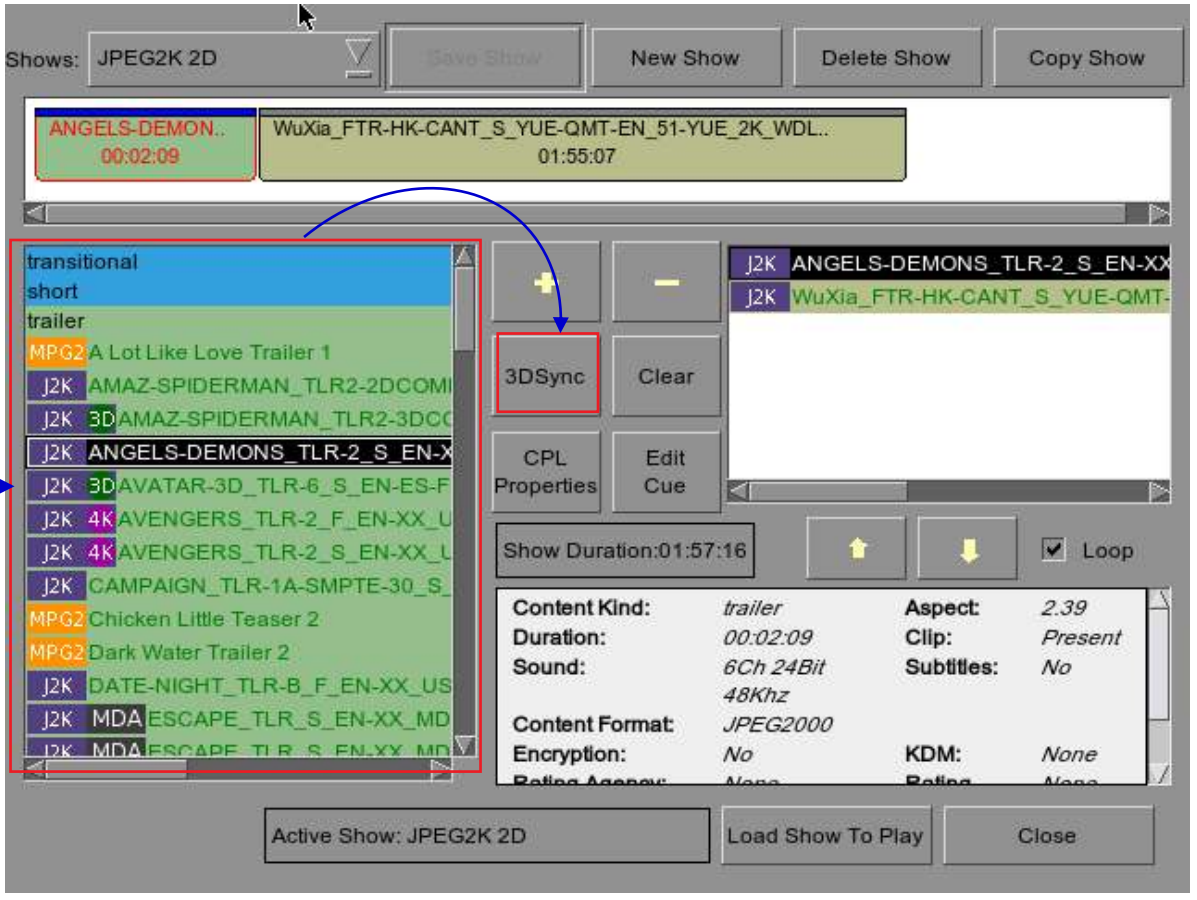
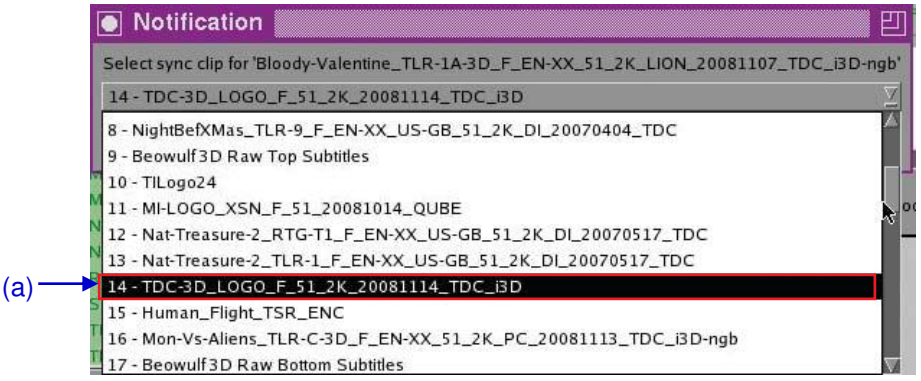


Figure 41 Synchronizing the clips.

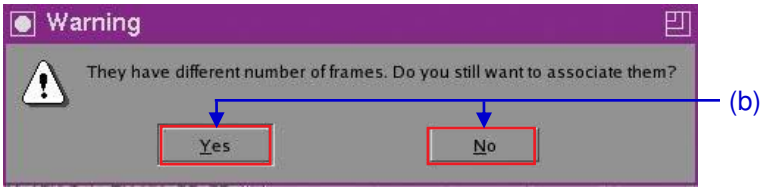
1	On the Playlist Management, select the clip from the Contents you want to associate with another clip for 3D showing and then press 3D Sync. A small window pops out as seen below.

2

(a) Select the clip you want to associate with the previous clip you selected from Contents and then press OK.



(b) Clips with the same number of frames will be immediately synchronized. If the clips don't have the same number of frames, a small window will pop out as seen below.



(c) Select Yes to confirm or No to cancel. Notice that the title of synchronized clips in Contents will change after confirmation. [3D] is added before the title of the clip.

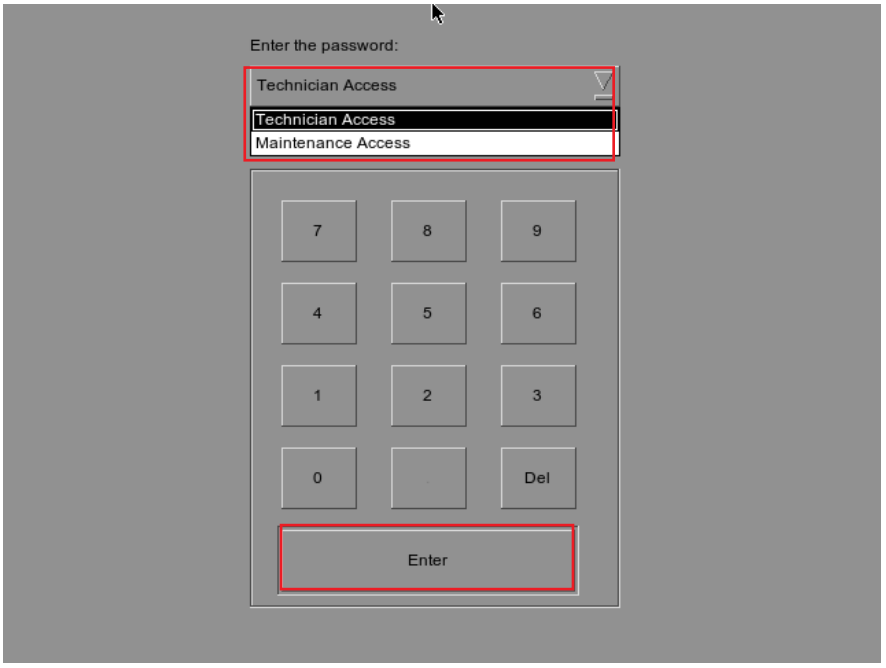
2.7. IMB Configuration

2.7.1. CineCanvas™ Configuration

Connect a network cable from the Ethernet 2 port of the IMB to the LAN port of the projector that will accept CineCanvas™ communication. Make sure the IMB and projector are set on the same subnet network. For example, if the projector is set to 10.10.10.10 and the IMB is set to 192.168.0.200, either the IMB has to change its IP to 10.10.10.xxx or the projector has to change its IP to 192.168.0.xxx for them to be on the same network.

*Assuming default subnet of 255.255.255.0

Figure 42 SMS Interface [Configuration].

1	On the SMS Interface, press Configuration. A prompt for Maintenance/Technician password opens. Select Maintenance from the dropdown list. Type in the correct password and press [Enter].  ***NOTE:*** *Only Maintenance access has permission to view or change settings on the CineCanvas™ tab.*

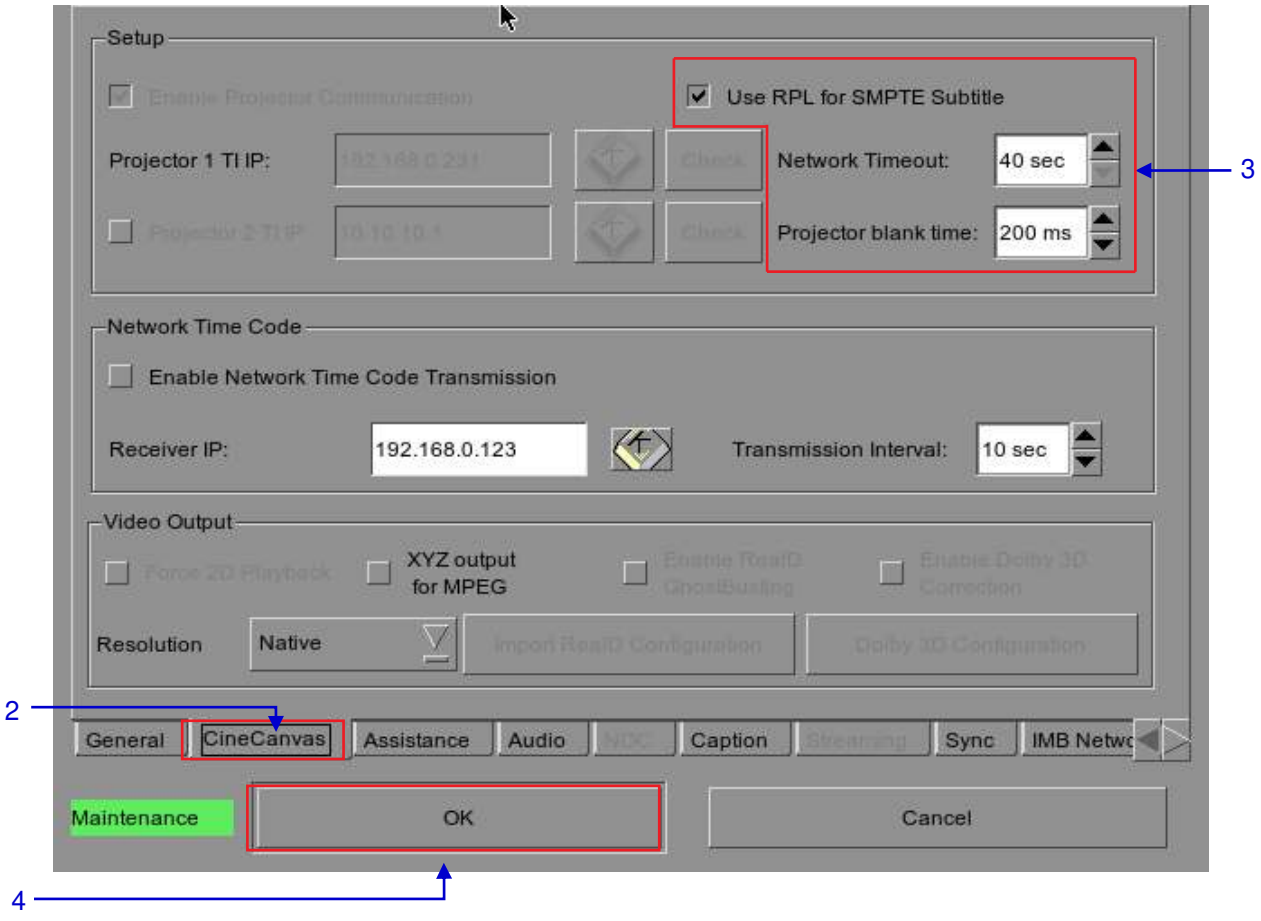
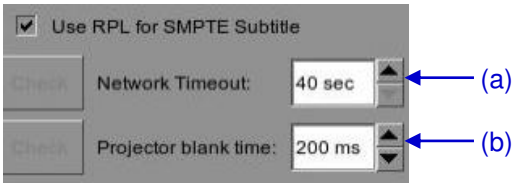


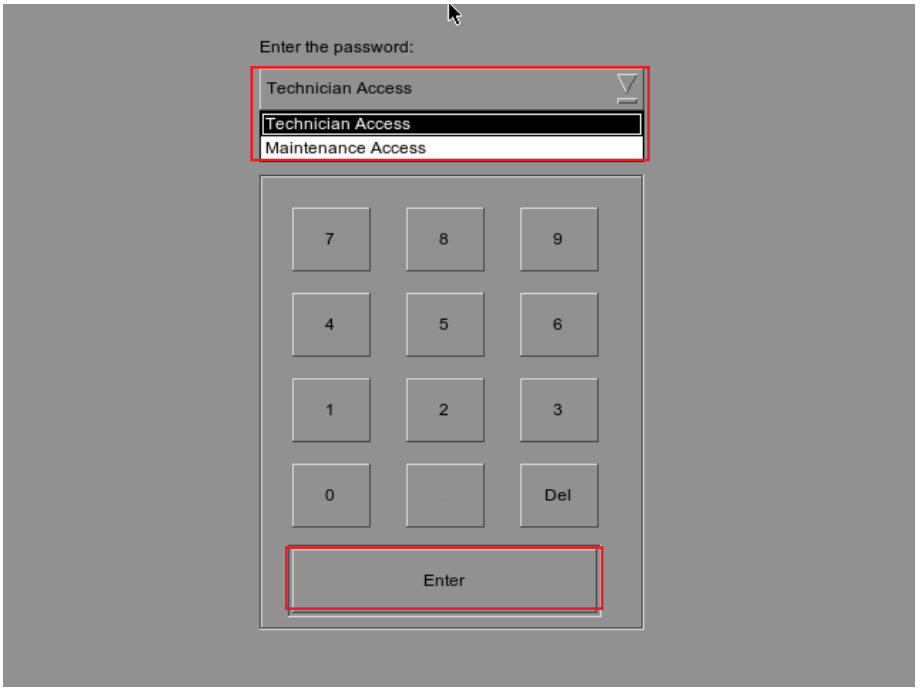
Figure 43 Setting up Cinecanvas subtitling option.

2	A new window for the Configuration opens as seen in **Figure 38**. Press CineCanvas to open the CineCanvas.
3	Use the [▲] [▼] buttons to adjust the Network Time out and Projector blank time. (a) At Network Timeout, indicate how long the IMB will wait for the projector to respond to accept the subtitles before popping up an error message. Error can occur due to: • Incorrect configurations on the IMB and projector. Make sure the IMB and projector are set on the same LAN network. • Loose network cable connection between the IMB and projector. (b) At Projector blank time, indicate how long the projector should be blanked during change of PCF or format before playback should commence. This is needed because the projector shows some noise when the PCF or format is changed. 
4	Once set, press [OK] to apply settings and return to SMS Interface.

2.7.2. Dolby 3D Setup

Once you have obtained a license from GDC, you will be given an update that enables Dolby 3D configuration. Dolby 3D setup requires that you have a PC that can be connected to the IMB network, so that you can access a web interface on the IMB. The Dolby color test patterns must be ingested to the IMB. Please contact your regional GDC Services Team for the Dolby color test patterns.

1	On the SMS Interface, press Configuration. A prompt for Maintenance/Technician password opens. Select Maintenance from the dropdown list. Type in the correct password and press [Enter].



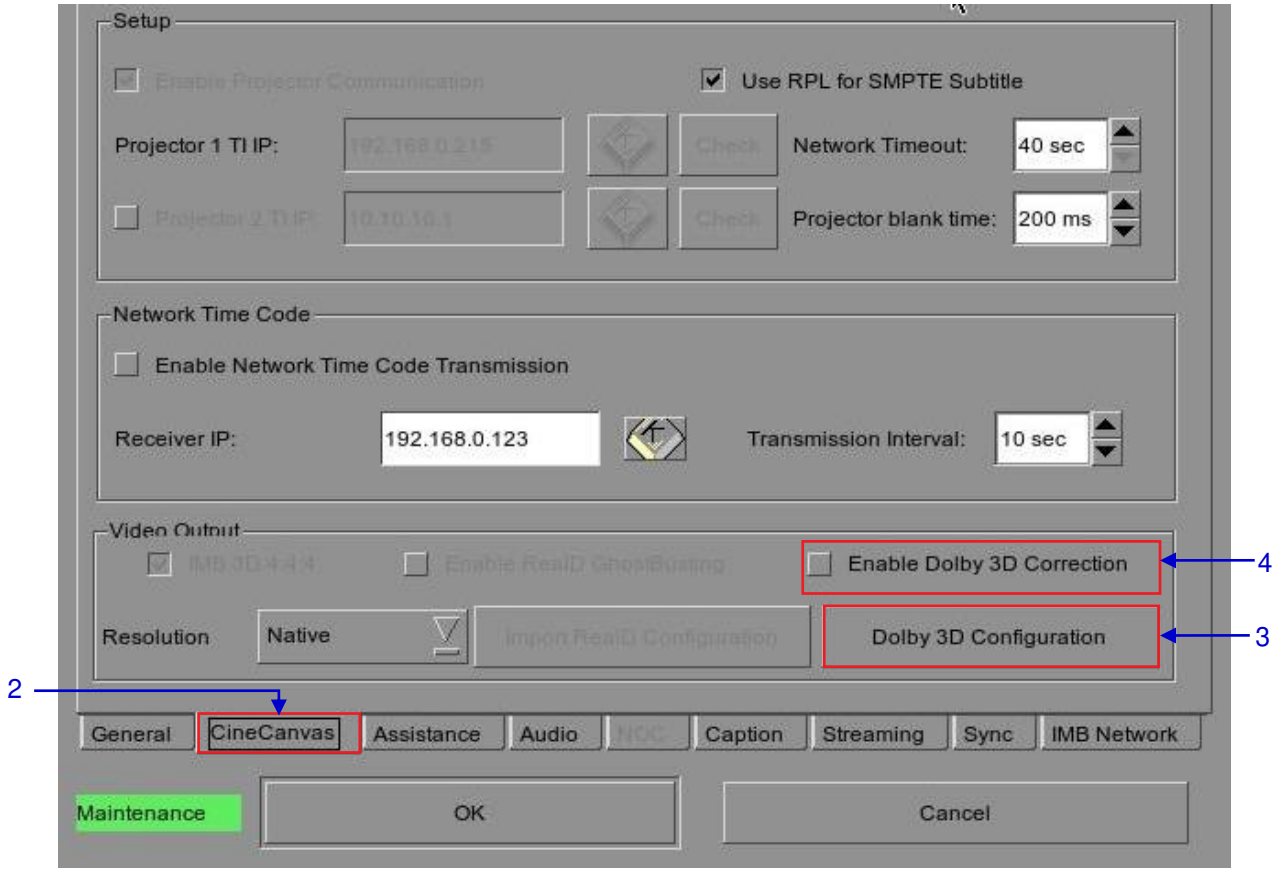


Figure 44 Dolby 3D setup.

2	A new window for Configuration opens as seen in **Figure 44.** Press CineCanvas to open the CineCanvas.
3	Click Dolby 3D Configuration to access the DFC IP address configuration. Enter the IP address of the DFC and check the DFC IP address box. If there is no DFC, make sure that the DFC IP address box is NOT checked.
4	Once you have setup the DFC IP address, check the box Enable Dolby 3D Correction.
5	Setup the Dolby 3D filter wheel, Dolby filter controller and glasses; check that the IMB is able to access the projector and the filter controller via the network.
6	Connect your laptop, open a browser and point to http://server-ip/cgi-bin/dolby3dConfig. From here you will follow the wizard to setup color correction for the GDC IMB. The DFC Controller will automatically turn on and off whenever a 3D playlist is being played. **server-ip refers to the SOM IP address configured in SMS Configuration IMB Network.

2.8. Series 2 DLP CINEMA® Projector Setup

There are several points to be noted when setting up the GDC IMB with a Series 2 DLP Cinema® projector. SMS version 10.0 supports Series 2 projectors, the section below details additional steps required for full Series 2 compatibility. If any fields are left blank the default values are assumed. Login and password fields only need to be entered if the user has changed these parameters on the projector.

2.8.1. Automation Setup

1	On the Automation, press Devices. This section will describe individual projector setup. An example Barco setup is seen in **Figure 45**.

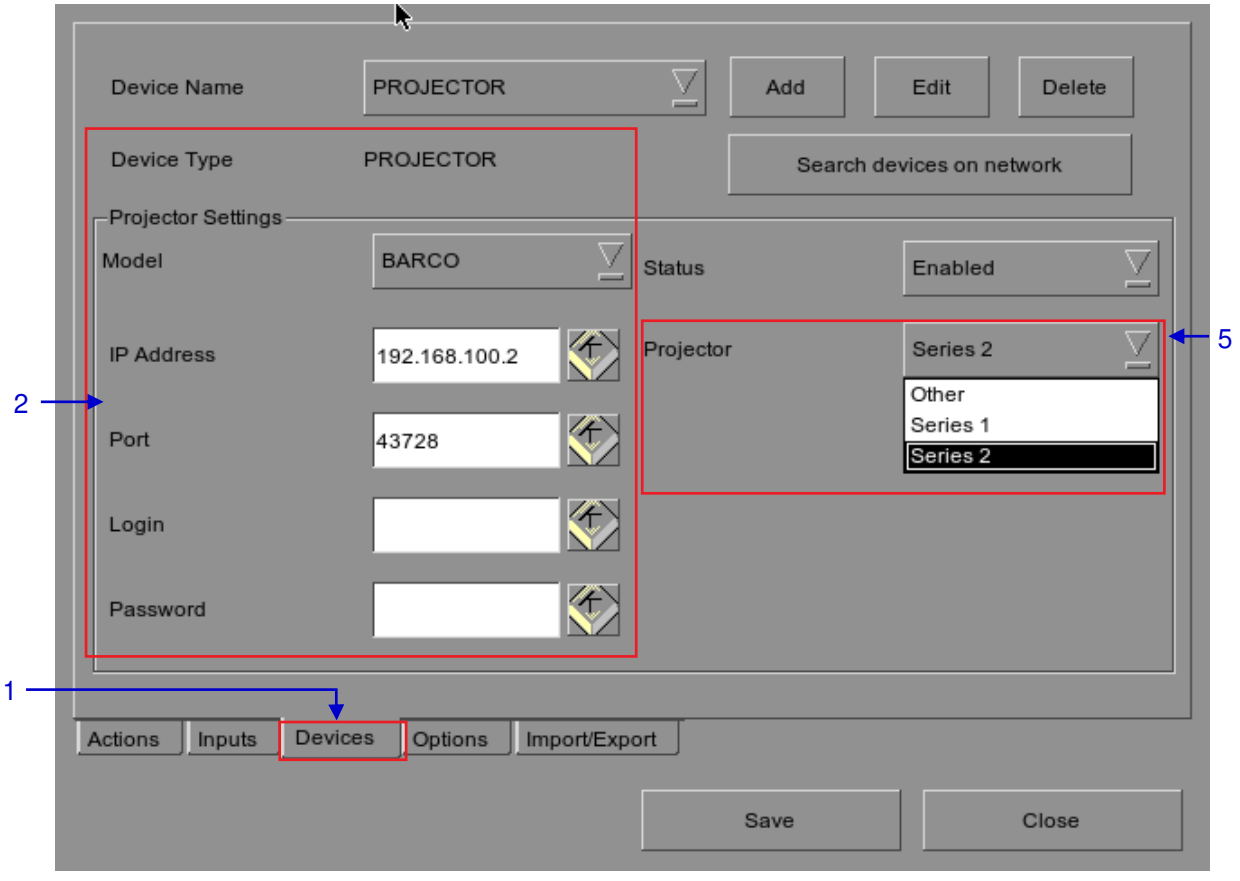
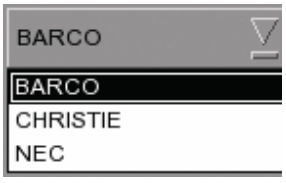
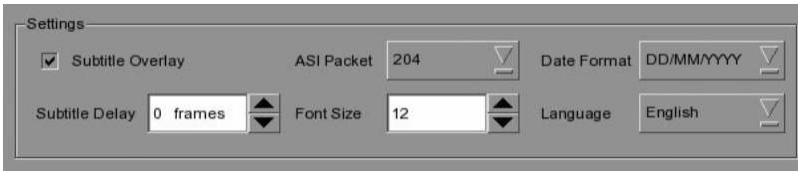


Figure 45 Setting the device type.

2	To setup a Barco Series 2 Projector go to SMS-> Configuration -> General- Automation -> Devices ->Add-> Device Type-> Projector-> Model-> BARCO. The Device Type should be setup as PROJECTOR and Model set to BARCO. 
3	To set up the Christie Series 2 projector the Device Type should be setup as PROJECTOR and Model set to CHRISTIE.
4	To setup an NEC Series 2 projector the Device Type should be setup as PROJECTOR and Model set to NEC.
5	Select Series 2 from the projector combo box to ensure a proper port number is set for Series 2 projector.

2.8.2. Subtitle Overlay

2.8.2.1. Subtitle Overlay Setup

1	Subtitle Overlay is supported for Series 2 projectors for 2D JPEG2000 content.
2	To setup Subtitle Overlay go to SMS -> Configuration -> Maintenance Access -> General. Under Settings there is a box titled Subtitle Overlay. You can also enter a Subtitle Delay in number of frames, entering a negative number will advance the subtitles by that number of frames. 

2.8.2.2. Subtitle Language Selection

Figure 46 SMS Interface [Control Panel]

1	Press the Control Panel Button to navigate to the Control Panel.

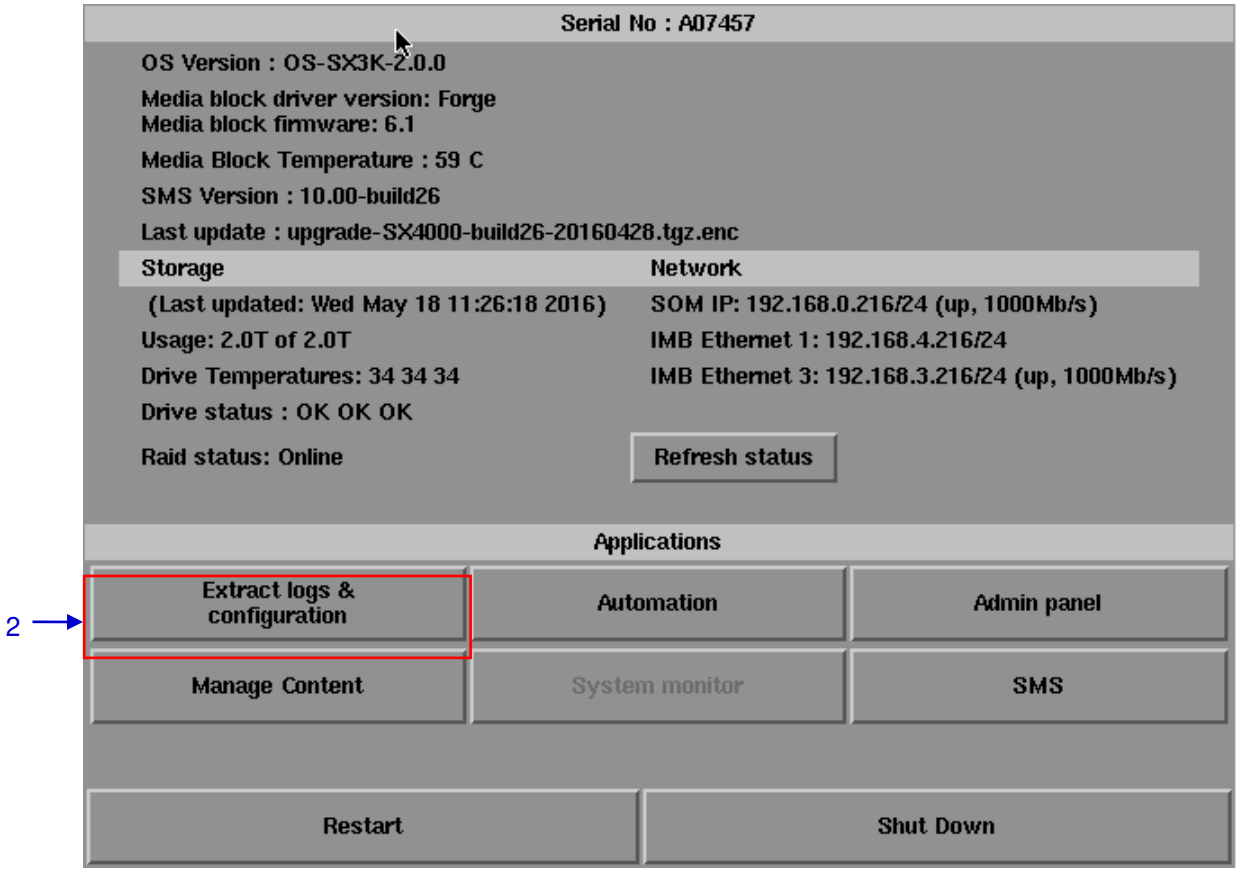


Figure 47 Control Panel

2	From the Control Panel select Manage Content.

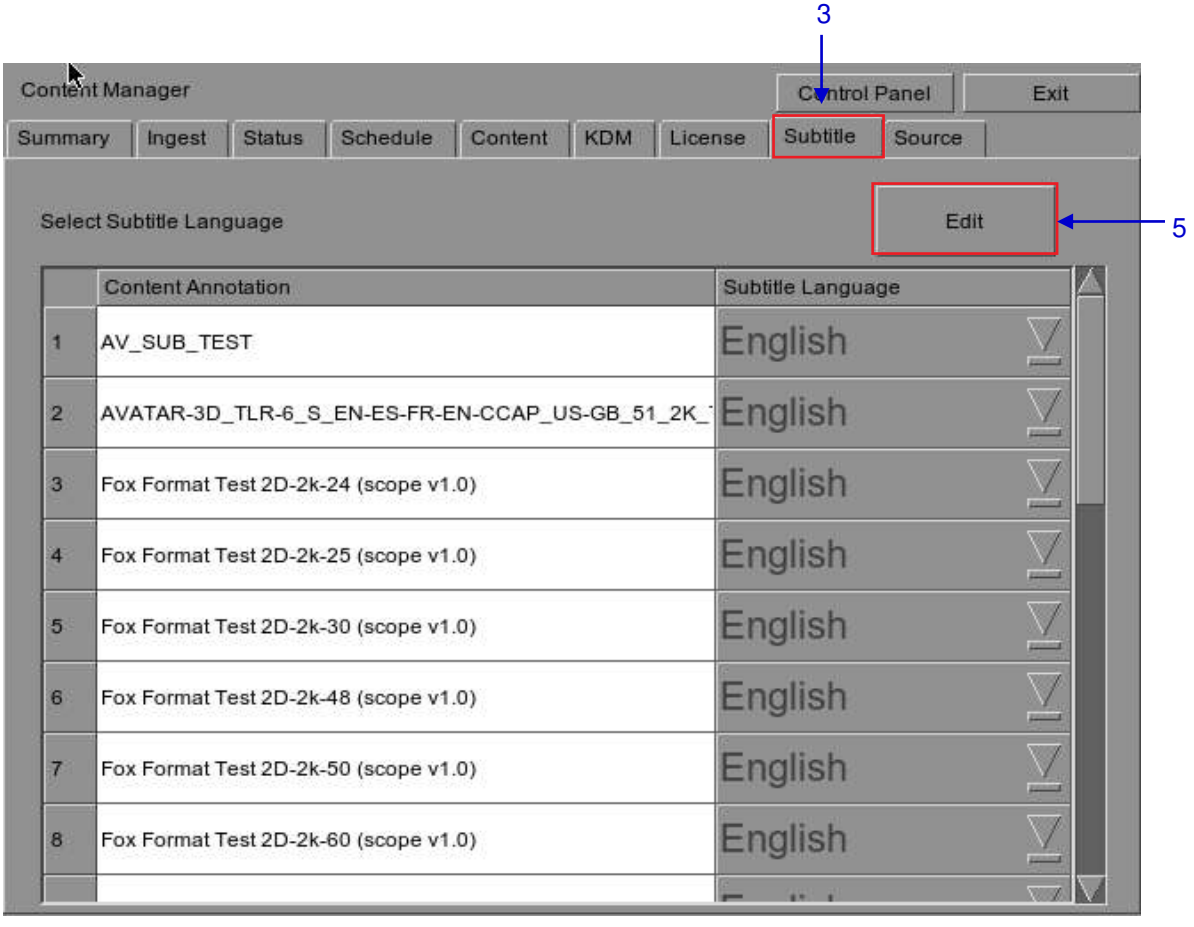


Figure 48 Editing the subtitle language.

3	Select the Subtitle tab to change the subtitle language.
4	When subtitle overlay is selected, the language for clips with subtitles can be configured in the Content Manager as seen in **Figure 48.** Setting the correct language for subtitles will ensure that subtitles will be rendered properly for each clip.
5	Press Edit and enter the maintenance password to change the language for the displayed clips.

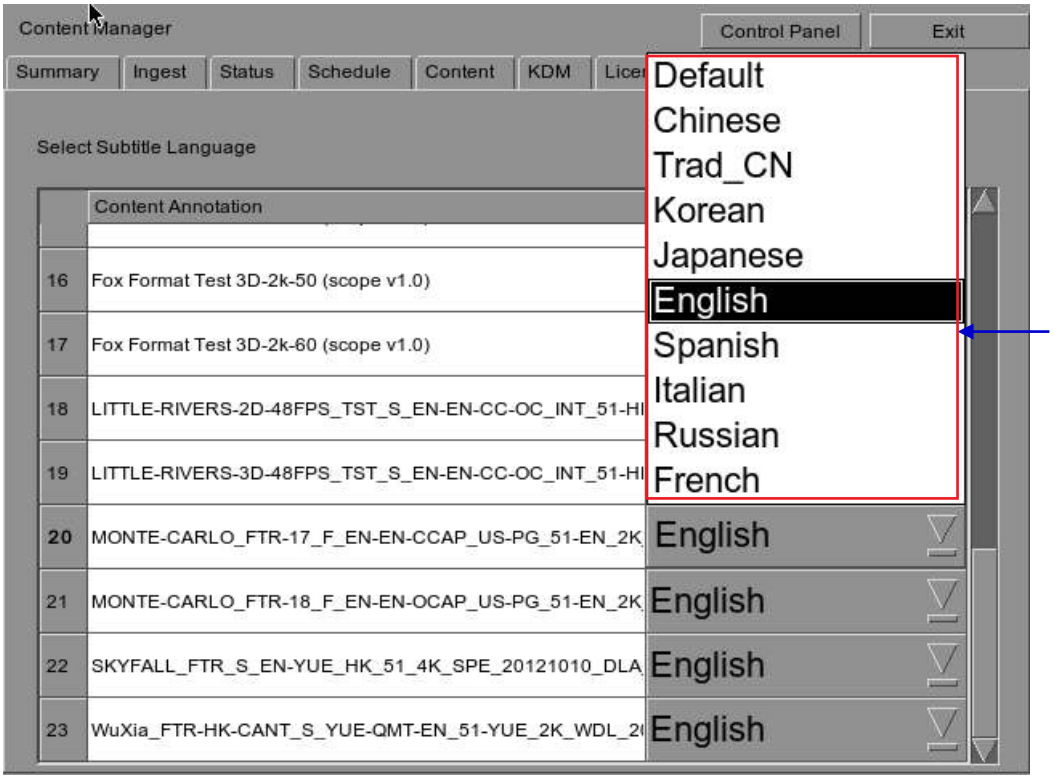


Figure 49 Subtitle language options.

6	As shown in **Figure 51**, the following languages can be set for each clip: • Simplified Chinese • Traditional Chinese • Korean • Japanese • English • Spanish • Italian • Russian • French The language setting can also be left as Default to automatically use the original language setting of the clip content.

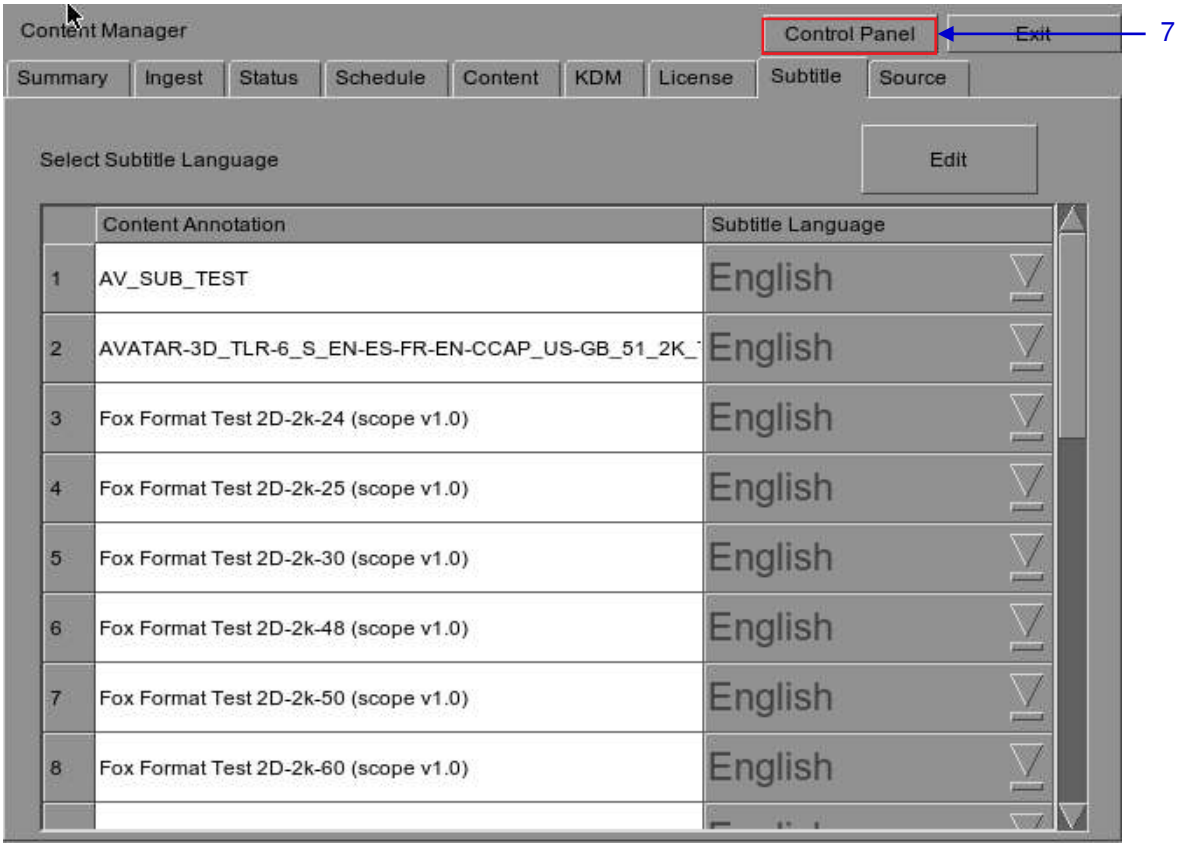


Figure 50 Returning to Control Panel.

7	Click the Control Panel button to return to the Control Panel.

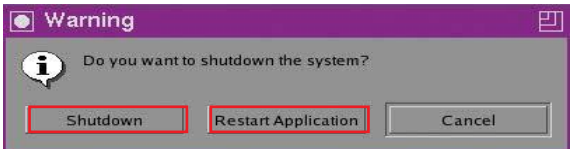
2.8.3. CineCanvas™ Support for Series 2 Projectors

CineCanvas™ support for Series 2 projectors will be enabled automatically when the Subtitle Overlay checkbox is **unchecked**. The IMB will determine whether CineCanvas™ is supported on the Series 2 projector. If the projector is capable of supporting CineCanvas™, it will be automatically enabled for content with subtitles.

2.9. Shutdown/Restart Application

2.9.1. Shutdown or Restart

Figure 51 Shutting down the system

1	On the SMS interface, when the Shutdown button is pressed, the system will prompt the user to select shutdown or restart application. Restarting the application will not reboot the IMB. It will only restart the software without affecting the hardware. allow some time for the IMB to restart the application or shutdown properly.  If the Use startup/shutdown password option on the Configuration/General is enabled, the system will prompt for a password before it shuts down. Please enter the Technician or Maintenance Access password.

3. CONTROL PANEL

3.1. About Control Panel

The Control Panel UI provides access to all the other interfaces used to configure and operate the SX-4000. To get to the Control Panel, press Control Panel on the SMS interface as shown in **Figure 52.**

Figure 52 Control Panel.

3.2. Control Panel

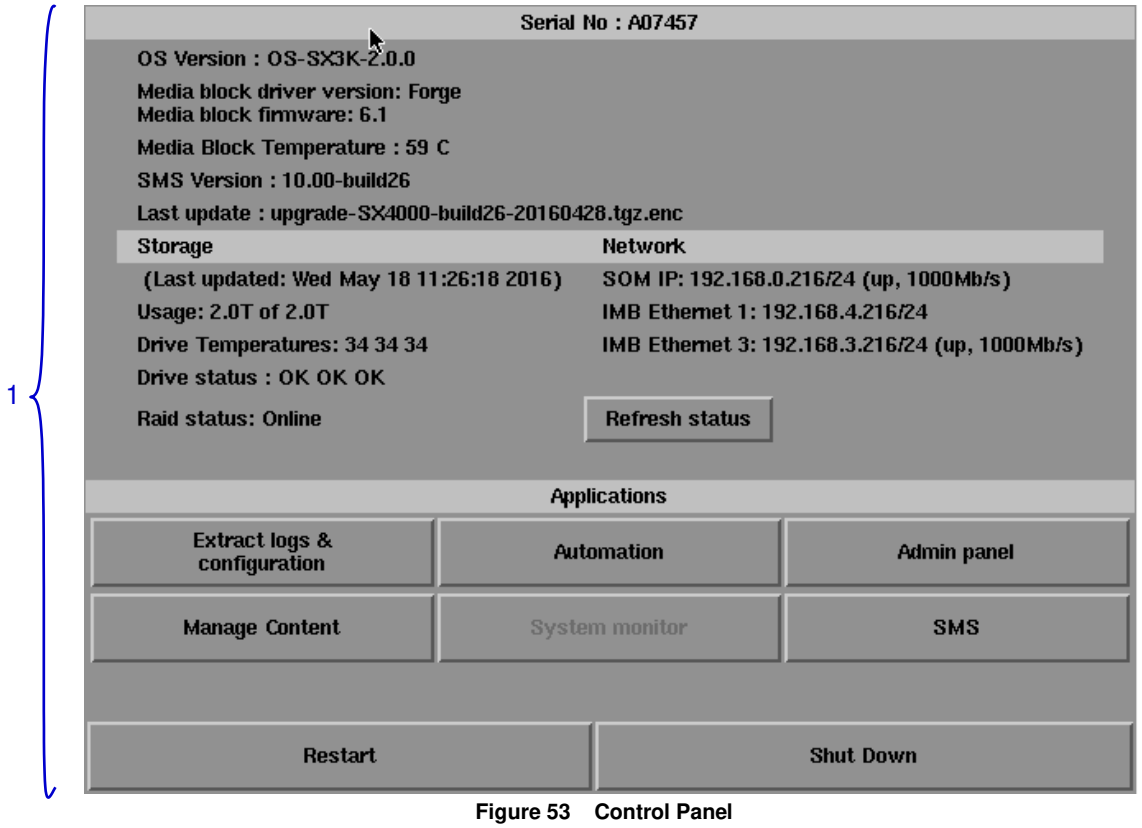


Figure 53 Control Panel

1	Switch **ON** the IMB and allow it to boot up to prompt directly to the SMS interface. When the SMS interface is shown, press the Control Panel button and a new window for the Control Panel opens as shown in **Figure 53**. The Control Panel includes the Automation button, Admin panel button, Manage Content button, SMS button, Restart button, Shutdown button and a Refresh status button. System information including the serial number, OS version, SMS version, network and storage information can also be seen on the Control Panel UI. ***NOTE:*** *The Refresh status button is used to manually refresh the status of the hard disks in the external storage device. This button should not be pressed during playback to prevent disruption of playback.* The SMS software continues to run in the background when using the Control Panel. This allows access to other IMB functions when playback is in progress. It is recommended that these functions be used very sparingly to avoid unnecessary system load that can potentially affect playback performance.

3.3. Manual Automation Execution

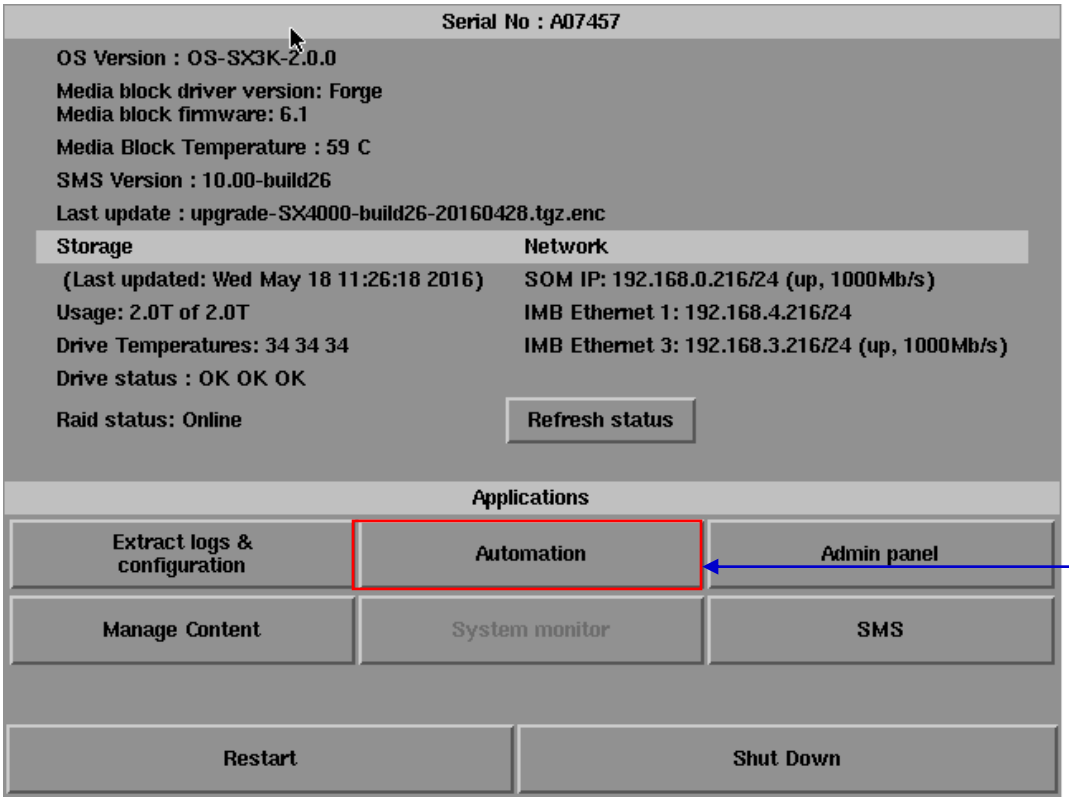


Figure 54 Accessing Automation.

1	Automation labels and projector commands can now be executed from an interface on the Control Panel. Press Automation on the Control Panel to start the manual automation interface as shown in **Figure 54.**

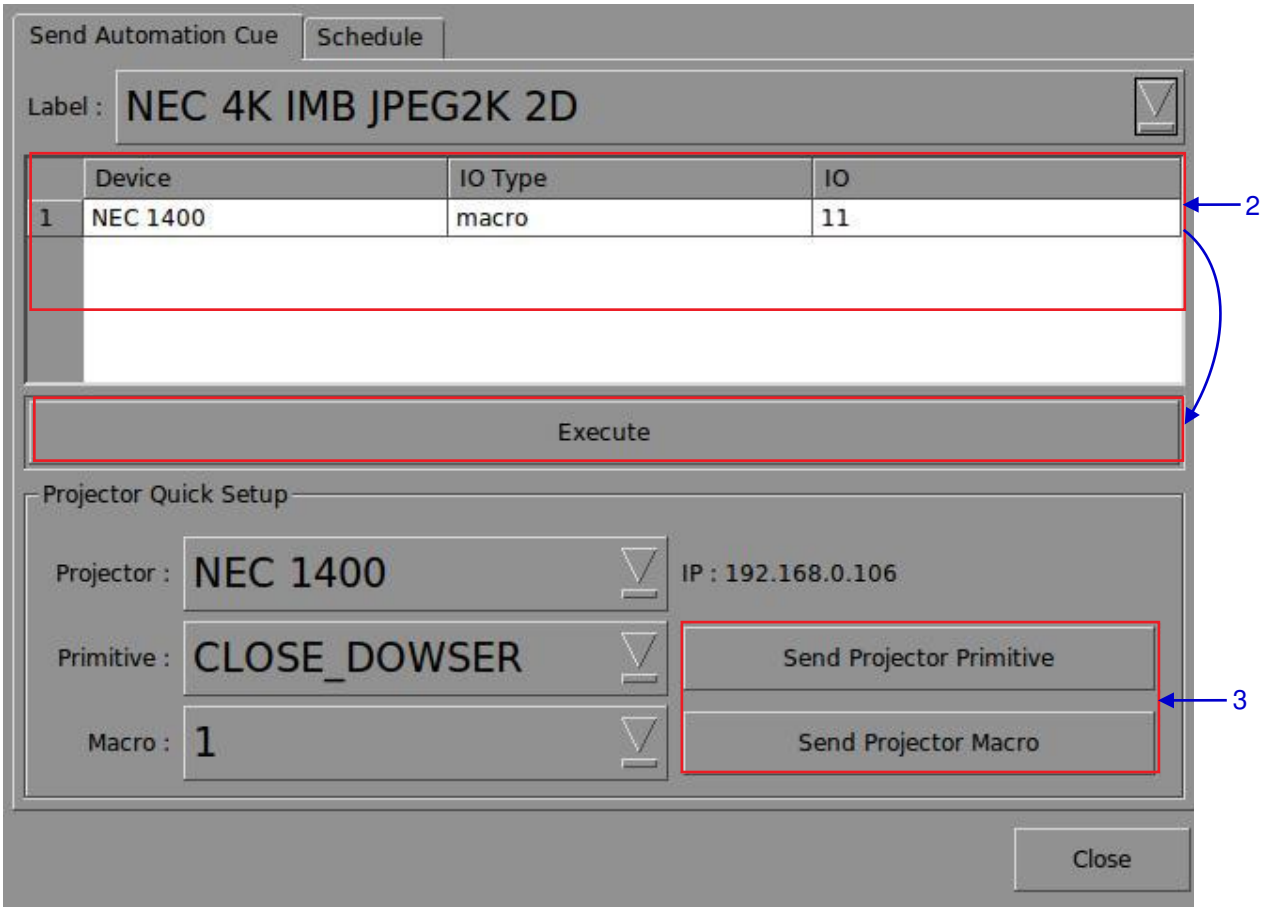


Figure 55 Executing Automation.

2	A new window opens as seen in **Figure 55.** Select an automation label to view the actions associated with the label. Press Execute to execute the automation label.
3	When a projector is configured for automation, projector primitives and macros can be triggered from this interface as well. Select the projector primitive or macro to be executed, and click the Send Projector Primitive or Send Projector Macro to send the command to the projector. Please refer to **Section 2.3.6. Automation** for instructions on how to configure automation labels, actions and devices.

3.4. Restarting the Control Panel

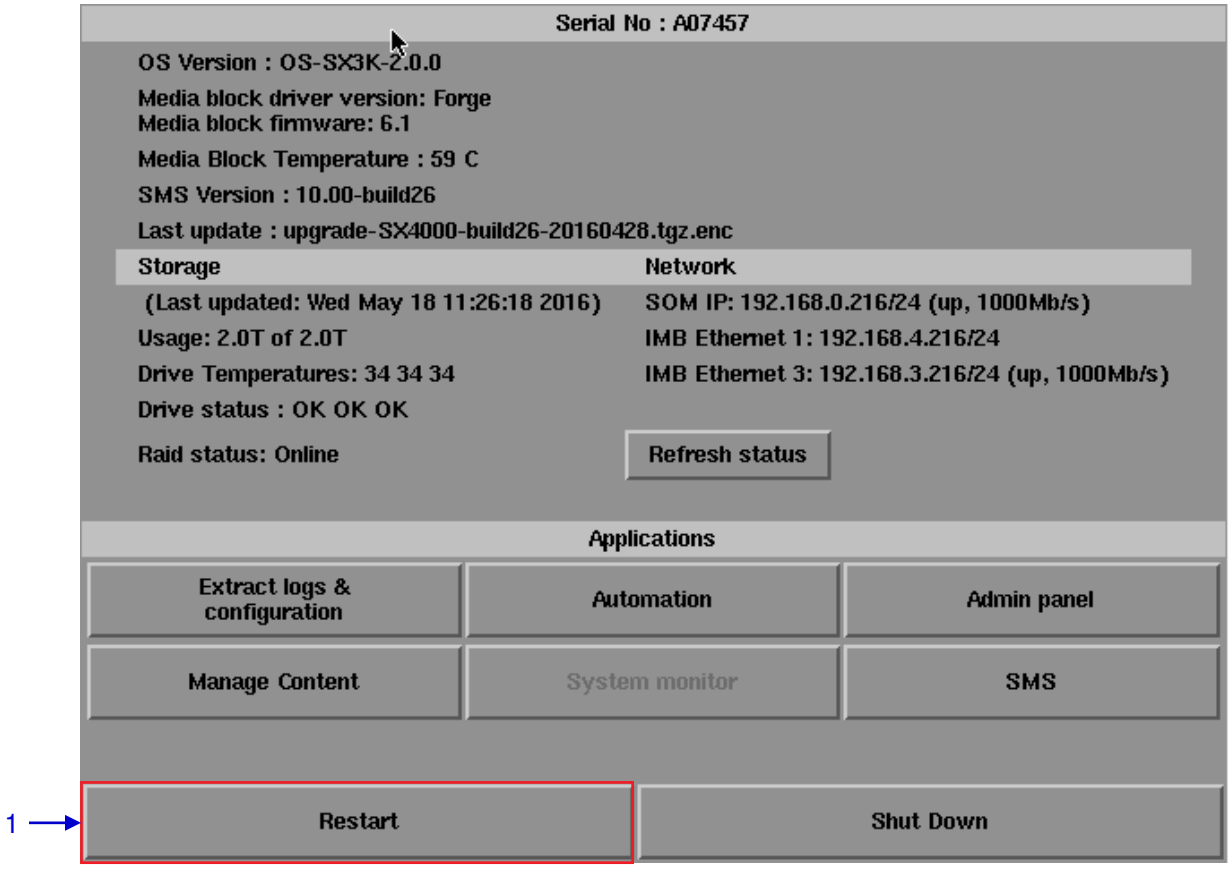


Figure 56 Selecting Restart on the Control Panel

1	Press Restart to restart the Control Panel. The Control Panel will restart and display the SMS interface as seen in **Figure 57**.

Figure 57 SMS interface.

3.5. Shutting Down the System

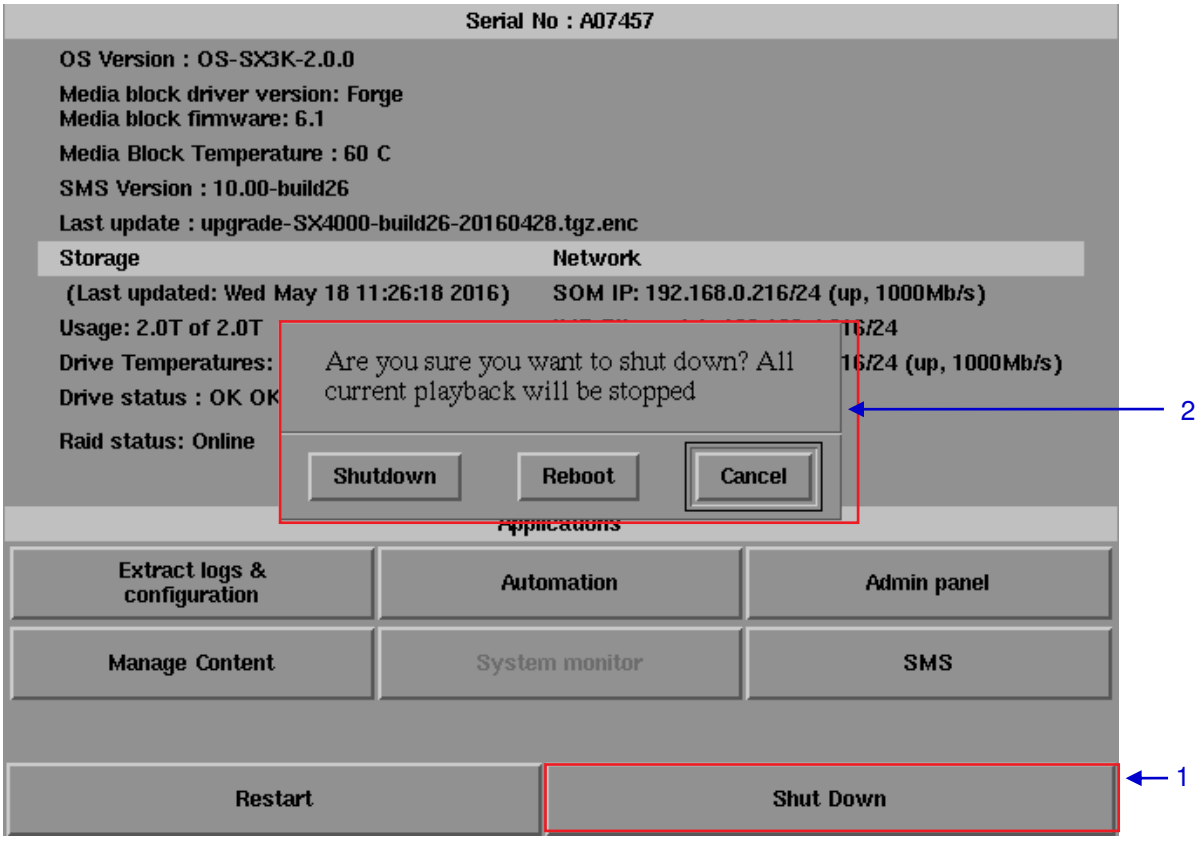


Figure 58 Shutting down the system.

1	Select Shutdown on the Control Panel.
2	A small window appears as seen in **Figure 58**. Select Shutdown to continue shutdown of IMB, or Cancel to cancel shutdown of IMB. All current playback will be stopped upon shutdown of the system. ***WARNING:*** *If current playback is still running in the background, it will be terminated once the IMB is shutdown. Please use with* ***CAUTION****.*

4. CONTENT MANAGER

4.1. About the Content Manager

4.1.1. Introduction

The SX-4000 Content Manager allows the user to manage the contents of the IMB to:

1. Download content from a disk or source on the network.
2. Download keys [KDM's] required for playing back content from disk or source on the network.
3. Delete content that exists in the IMB data storage.
4. Check that the content that is already on the IMB is fine and the files are complete and proper.

4.1.2. Accessing the Content Manager

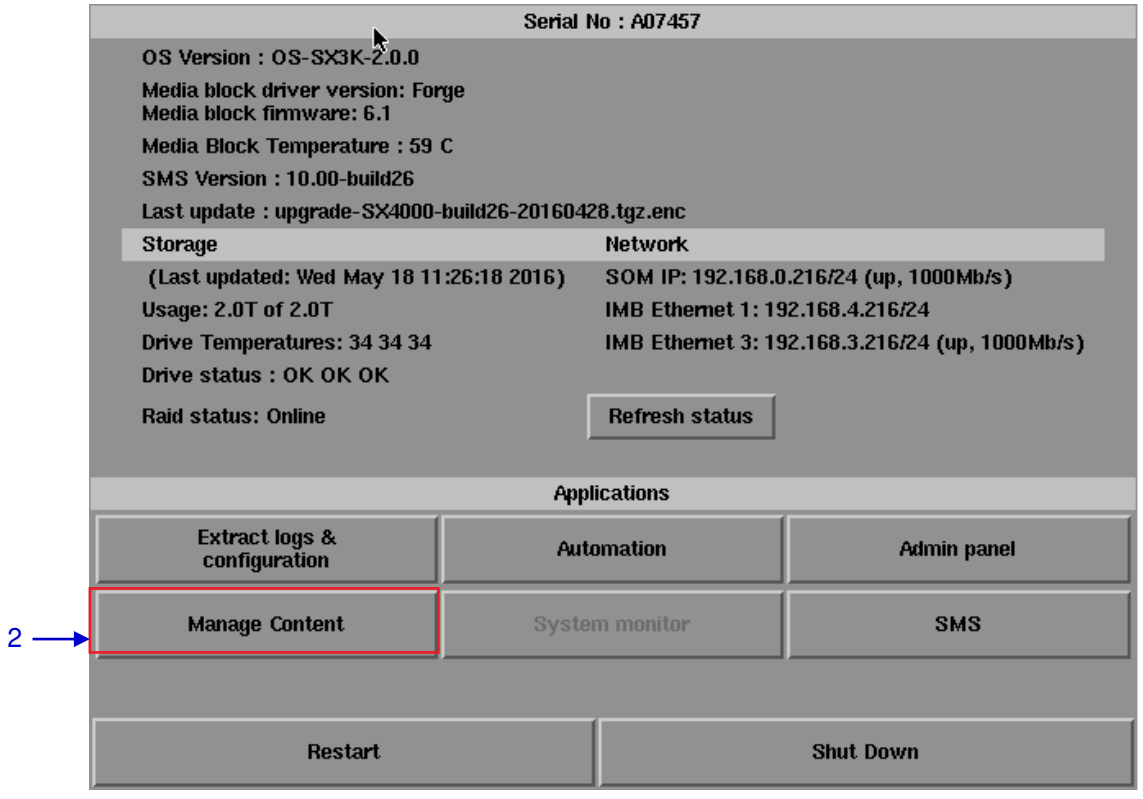


Figure 59 Manage Content Button.

1	Press Control Panel on the SMS Interface.
2	Press Manage Content to go to the Content Manager. ***NOTE:*** *The Content Manager can run in the background and does* ***NOT*** *need to be exited.*

4.2. Content Management

4.2.1. Ingesting Content

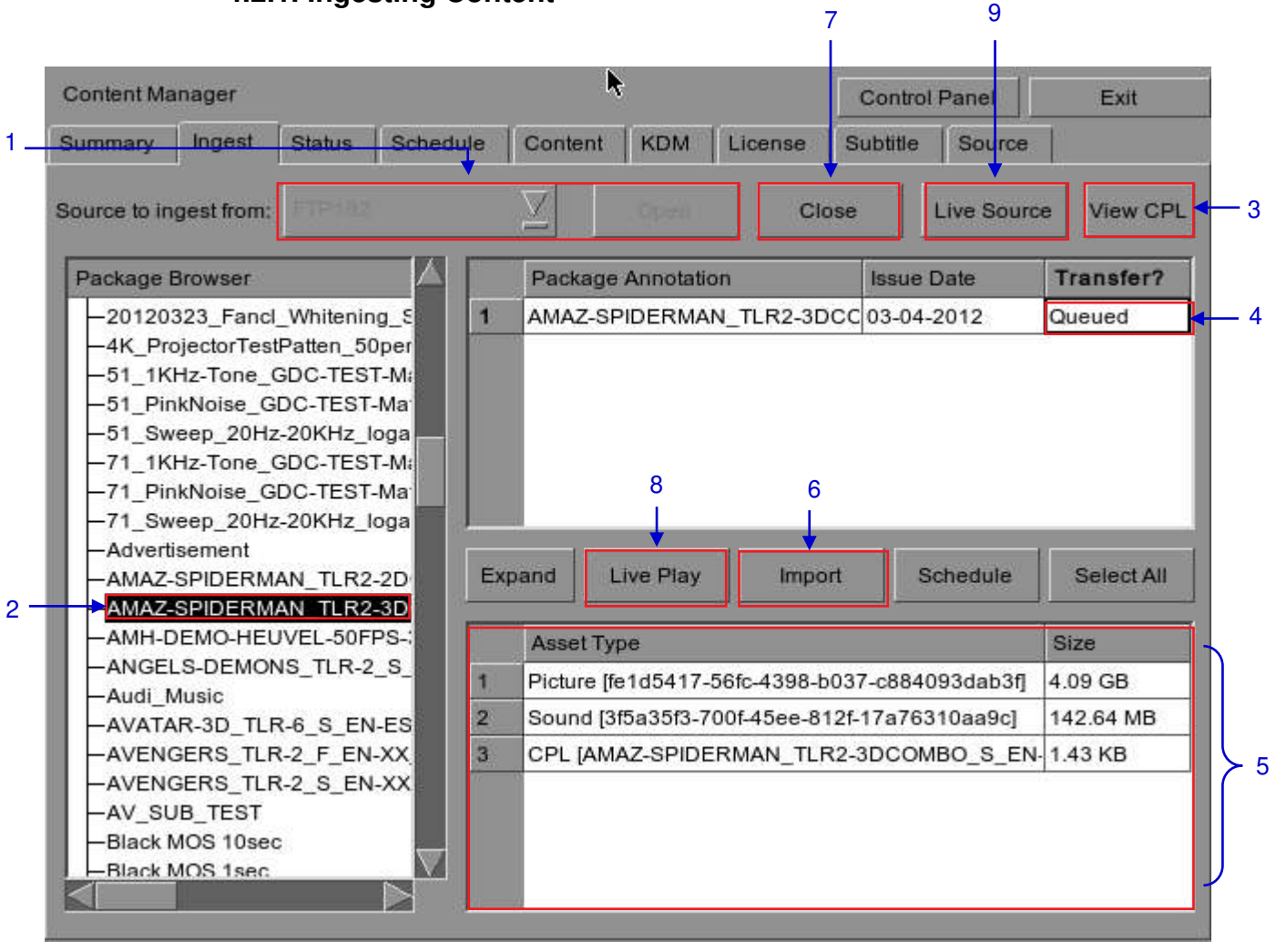


Figure 60 Ingesting a package or CPL from a source located in a specific directory in the network.

1	Select the source of data you want to ingest content from and click Open. Please refer to Section 4.5 Source Management to configure the source of data.
2	Browse the source and select the directory where the package is located. The list of packages in the directory will be displayed in the top right section of the screen.
3	Click View CPL to display the list of CPLs available in the packages. You can use this button to toggle between the package list and CPL list displayed in the top right section of the screen.
4	Click under the Transfer column to select the package or CPL you wish to download. A green check ✓ indicates a selected package or CPL. You can select multiple packages or CPLs.
5	Information about the selected package or CPL, including the file size, is shown in the section below the package or CPL list.
6	Press Import to queue downloading of the package or CPL. (To bypass ingestion for direct playback you can press Live Play instead. Refer to Live Play below for more info.)
7	When done selecting the package(s), click the Close button. ***IMPORTANT:*** *Always press Close after you are done starting the download of content. You can monitor the progress of ingest by pressing the Status button. Please refer to Section 4.2.4. Monitor Ingest Progress for more information about Status.*
8	Live Play can be used instead of Import in order to bypass content ingestion and play directly back from network source. This is not supported through USB but can be used for direct playback through network source (provided the network source has sufficient bandwidth to stream the content). ***IMPORTANT:*** *You should always use Import whenever possible.*
9	When you press the Live Source button you can view all clips currently mounted and available through the Live Play feature. You can detach Live Play sources through this interface as well. You should always detach live play sources whenever you are done using them via Live Play.

4.2.2. Ingesting Content from USB Disk

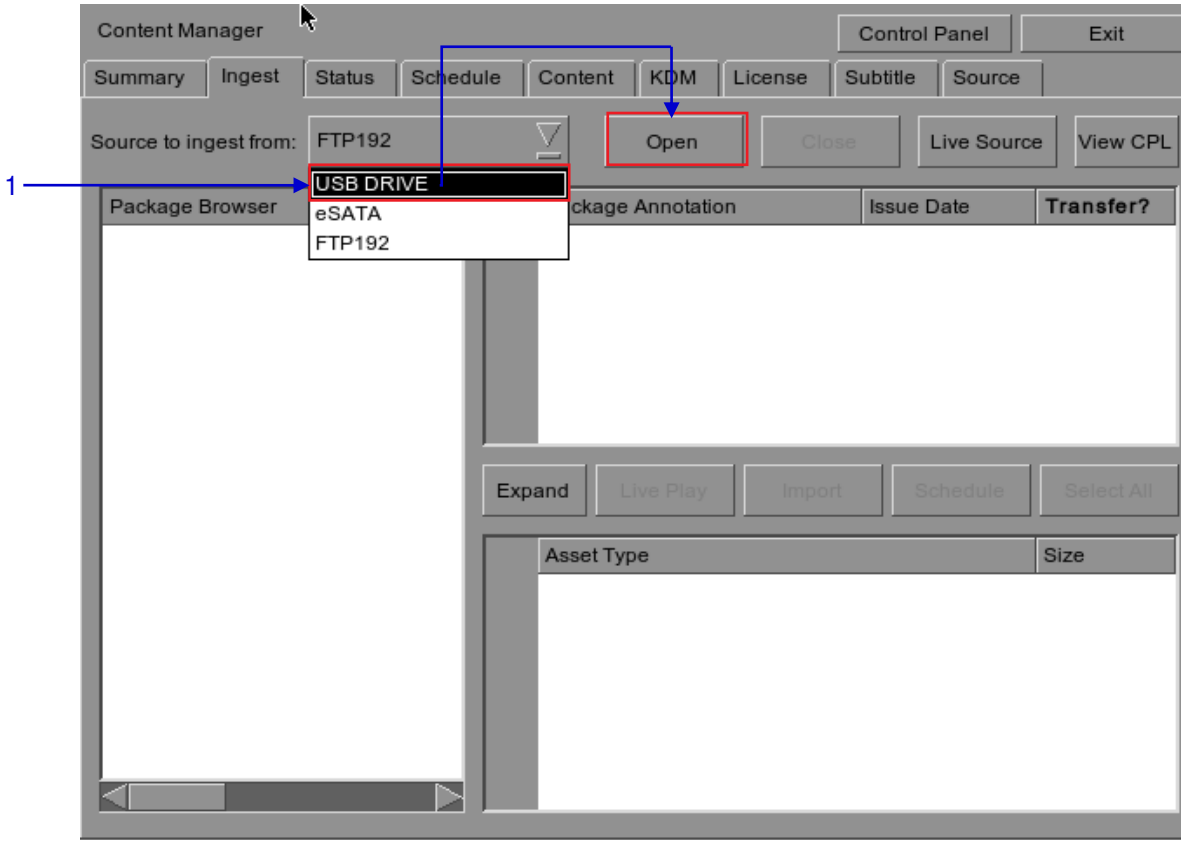


Figure 61 Opening a USB disk connected to the IMB.

1	Select USB drive from dropdown list and click Open. (Continued on next page)

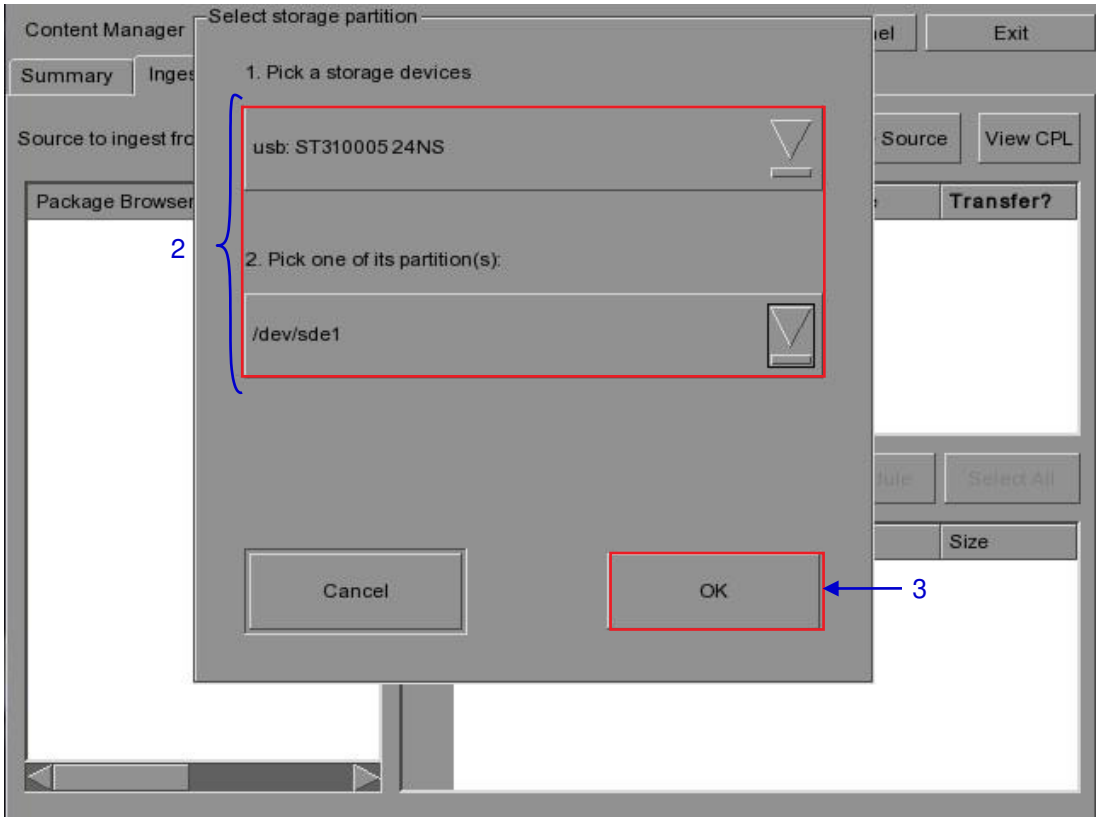


Figure 62 Selecting the USB storage device and its partition

2	Select a storage device and its partition from the dropdown lists.
3	Press OK to confirm the selection.

4.2.3. Ingesting KDMs

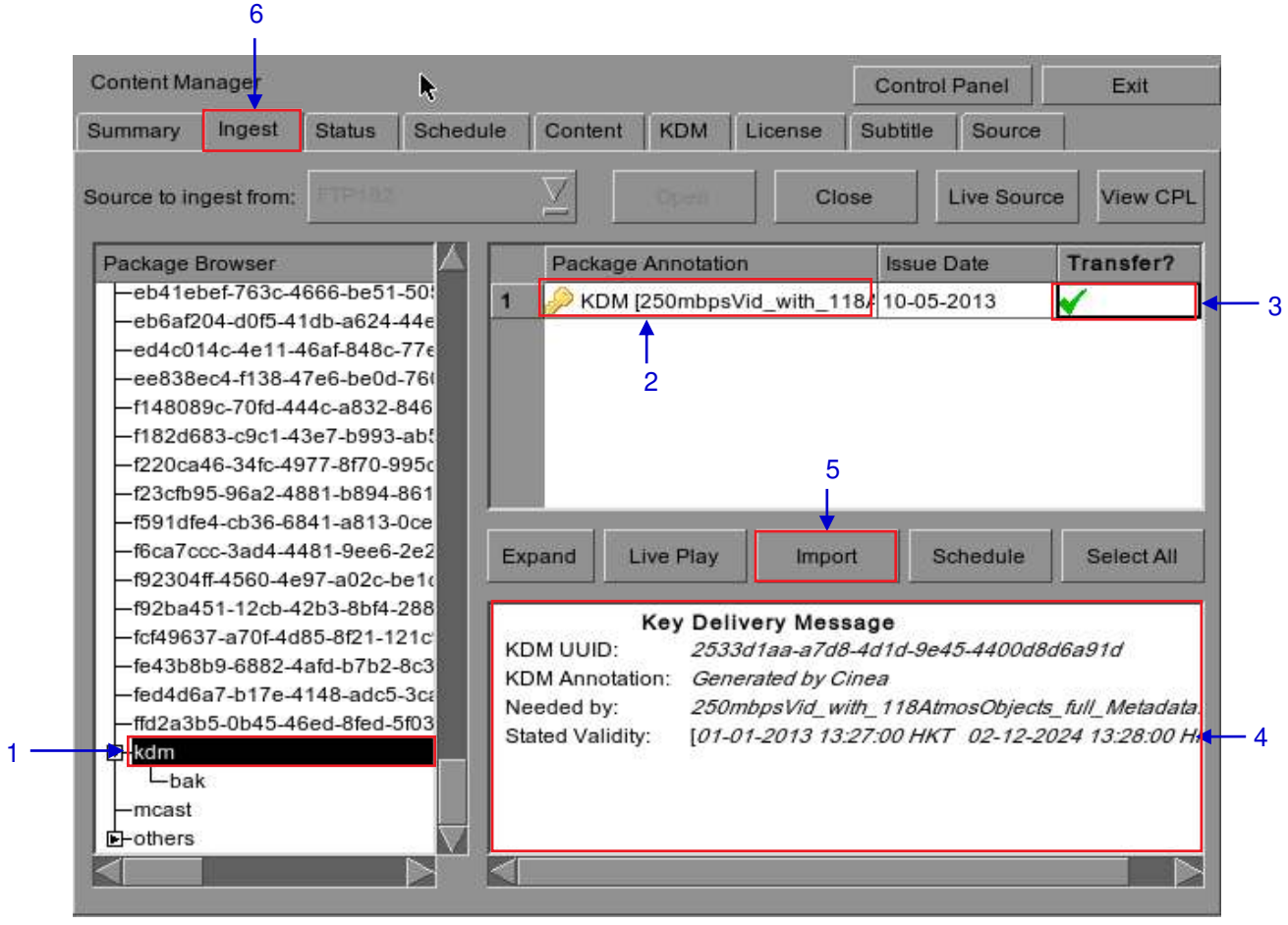


Figure 63 Ingesting KDM from a directory in the selected source.

1	Select the directory in the selected source where the KDM is located.
2	Shows the KDMs present in the selected directory that are valid for this IMB.
3	Click under the Transfer column to select the KDM you wish to download. A green check ✓ indicates the selected KDM.
4	Shows the details of the selected KDM, including target, CPL, and date of validity.
5	Press Import to start the import of the KDM. The green check will change to Queued.
6	When done selecting the KDM, press Close to close the Package Browser.

4.2.4. Monitor Ingest Progress

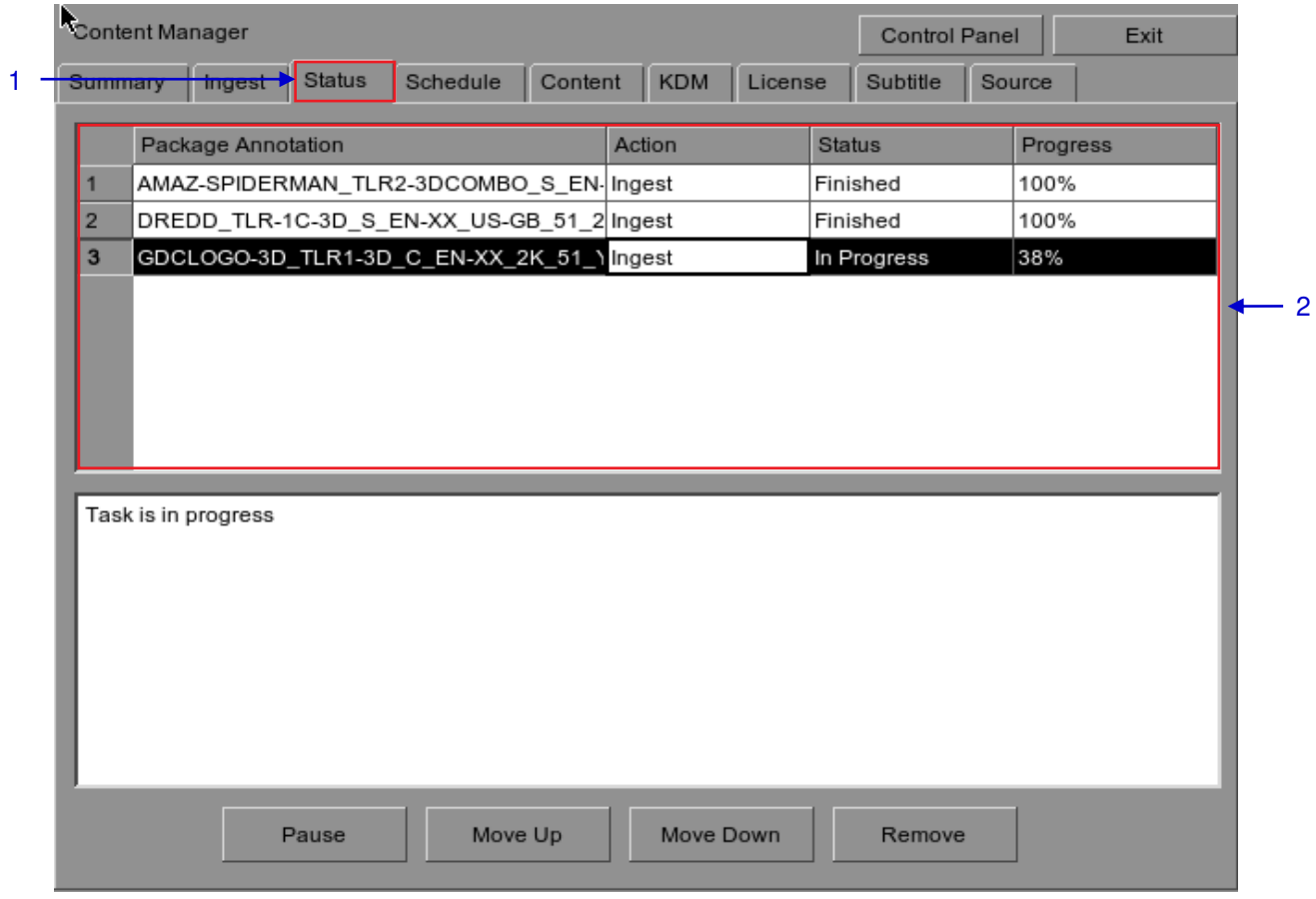


Figure 64 Monitoring the progress of download of the packages.

1	Select the Status option.
2	Shows the download status of the packages or CPLs. In this example, downloading of some packages or CPLs is incomplete.

4.2.5. Cancelling Ingest

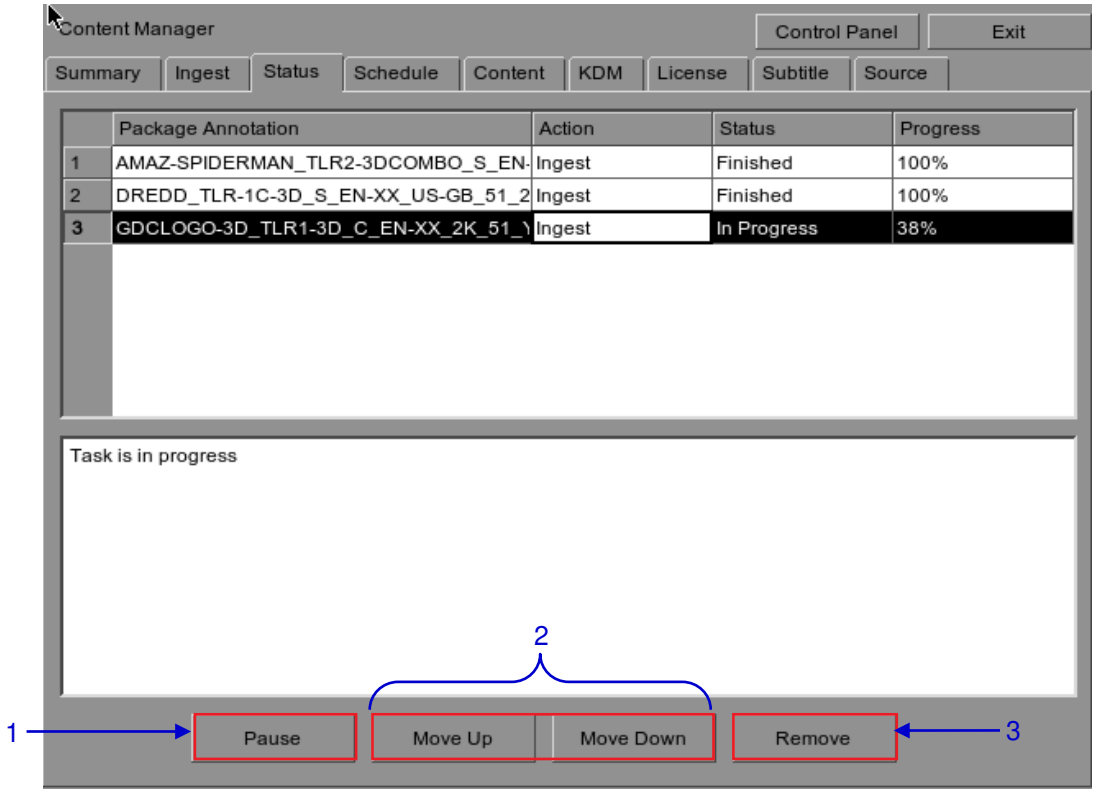


Figure 65 Content Manager - Status

1	Press Pause to temporarily stop the download of the package(s) or CPL(s). The Pause button will change to Start and will indicate that the download is being paused.
2	Use the Move Up and Move Down buttons to move the highlight bar up and down to select the desired package or CPL when multiple packages or CPLs are being downloaded. You can only move the highlighted bar to select the package or CPL when in Pause mode.
3	To cancel the download, select the desired package or CPL and press Remove.
4	If you wish to resume download, press Start button to resume the download.

4.2.6. Deleting Content

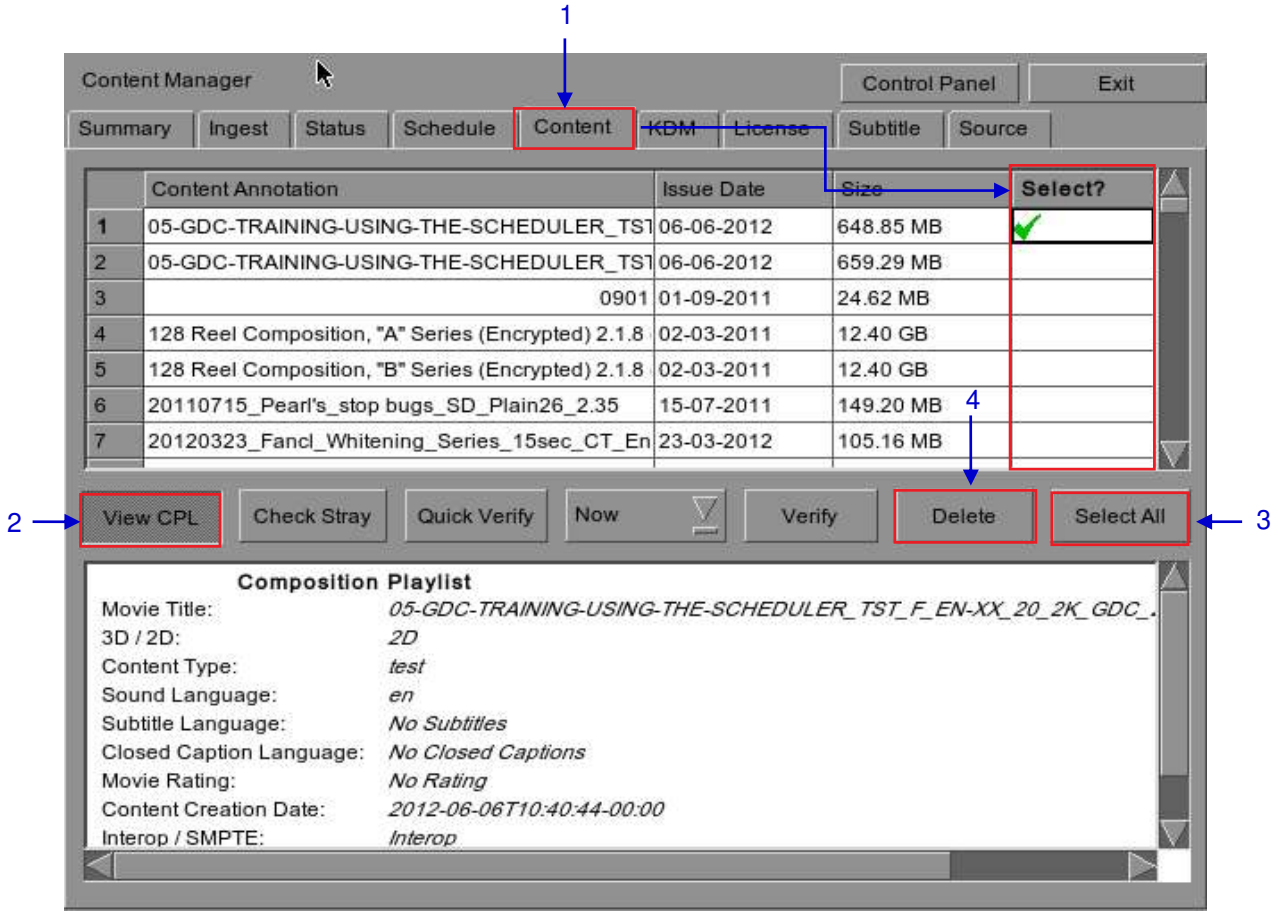
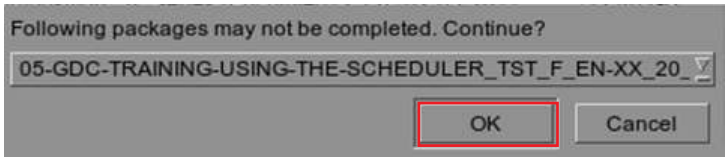


Figure 66 Deleting a downloaded package or CPL

1	To delete a package or CPL, go to Content and click under the Select column opposite the package or CPL you want to delete. A green check ✓ indicates the selection.
2	Click View CPL to toggle between the package and CPL lists displayed in the content interface.
3	You can select all by clicking the Select All button, and deselect by clicking the Deselect All button.
4	Press Delete to delete the selected package or CPL. A small window pops up to confirm the deletion of the package.  Press OK to confirm.

4.2.7. Checking Content Integrity

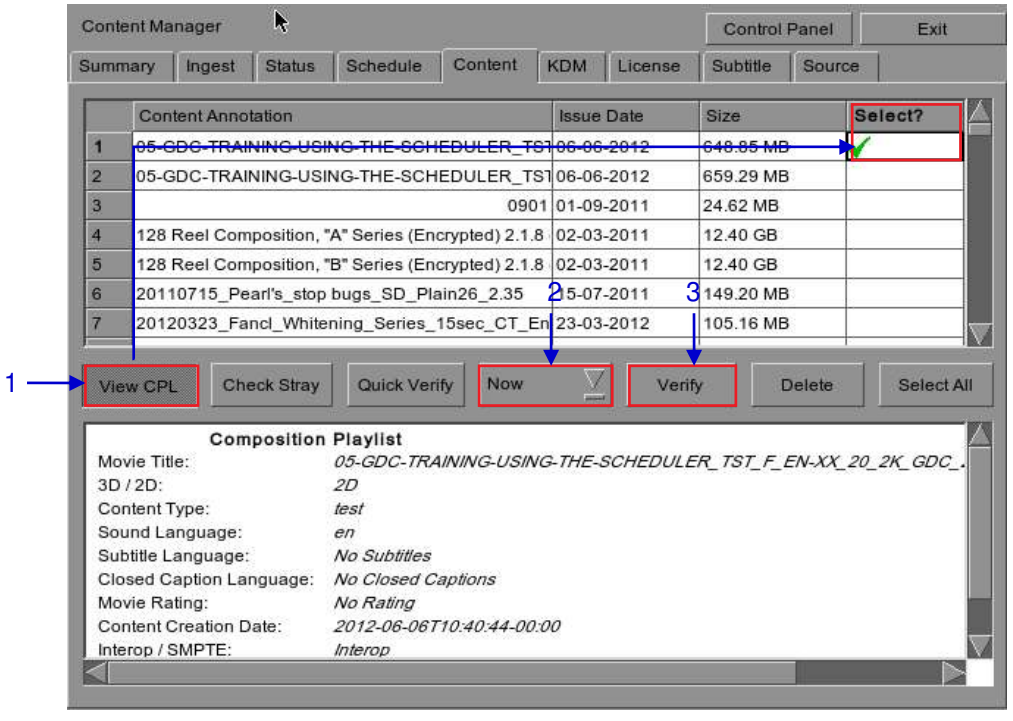
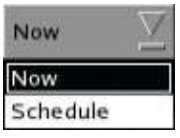
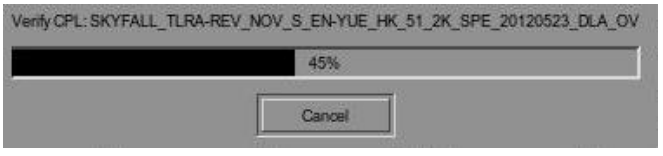


Figure 67 Verifying the integrity of the files in the package(s) or CPL(s).

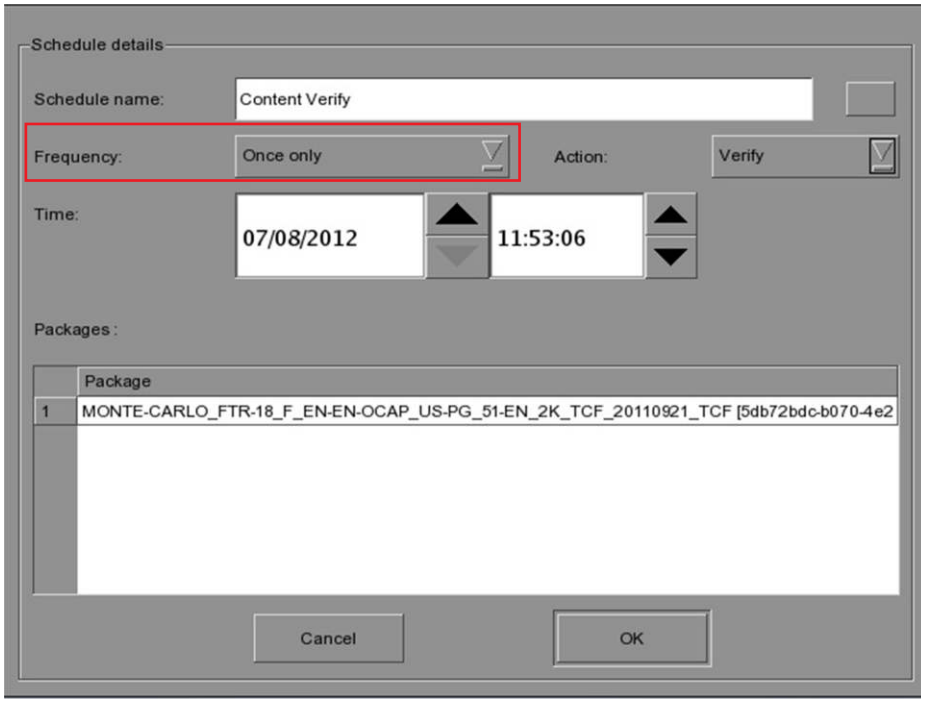
1	Click View CPL to toggle between the package and CPL lists displayed in the content interface. Click under the Select column opposite the package or CPL you want to verify. A green check ✓ indicates the selection.
2	Select if you want to verify Now or on a Schedule. 

3 Press Verify to check if all the required files are present in the selected package(s) or CPL(s).

(a) If Now is selected, the package will be verified immediately as seen below.



(b) If Schedule is selected, you need to assign a name and schedule the time and date when to verify the package(s) or CPL(s) in a new window as seen below.



(c) You can select the frequency of verification.

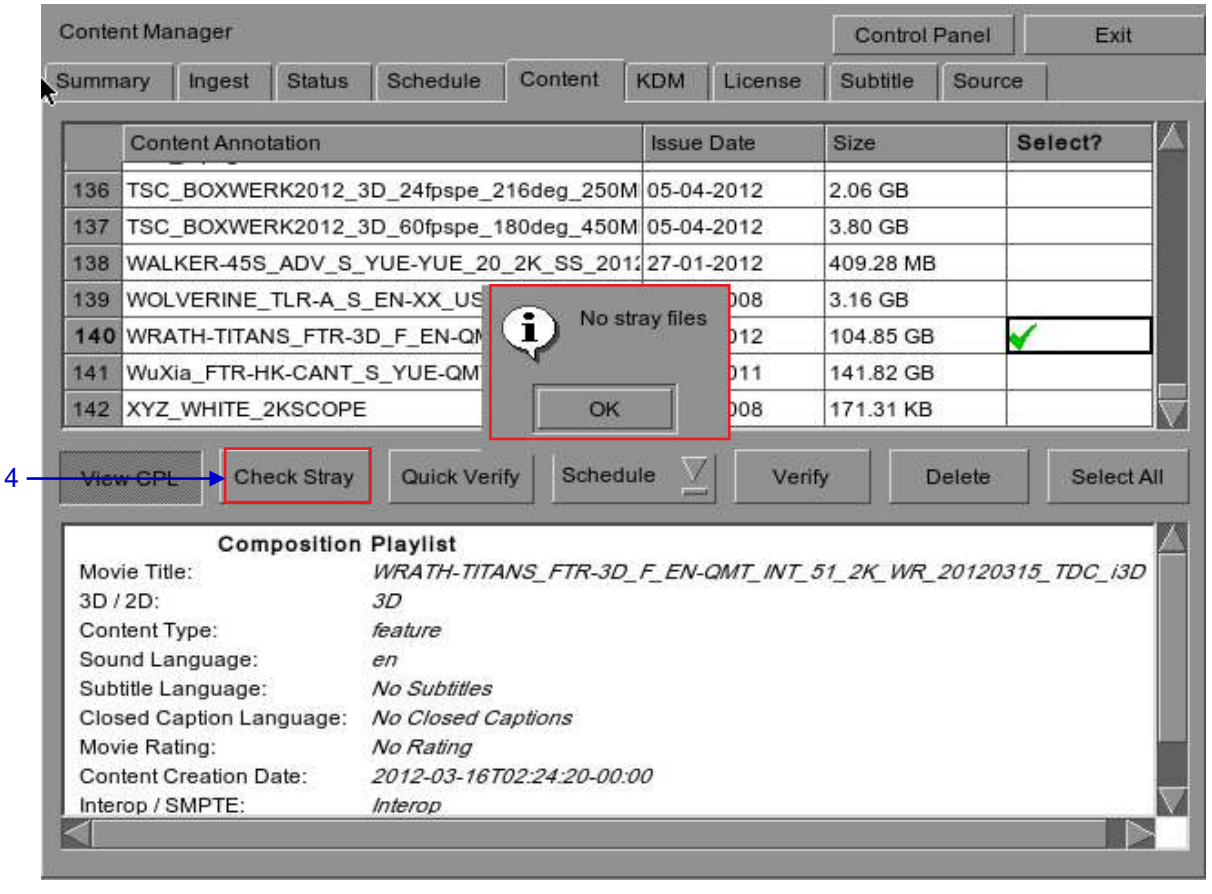


Figure 68 Checking for stray files in package(s) or CPL(s)

4	You can check if there are stray files in the selected package(s) or CPL(s) by pressing Check Stray. A small window pops out to confirm if there are no stray files.

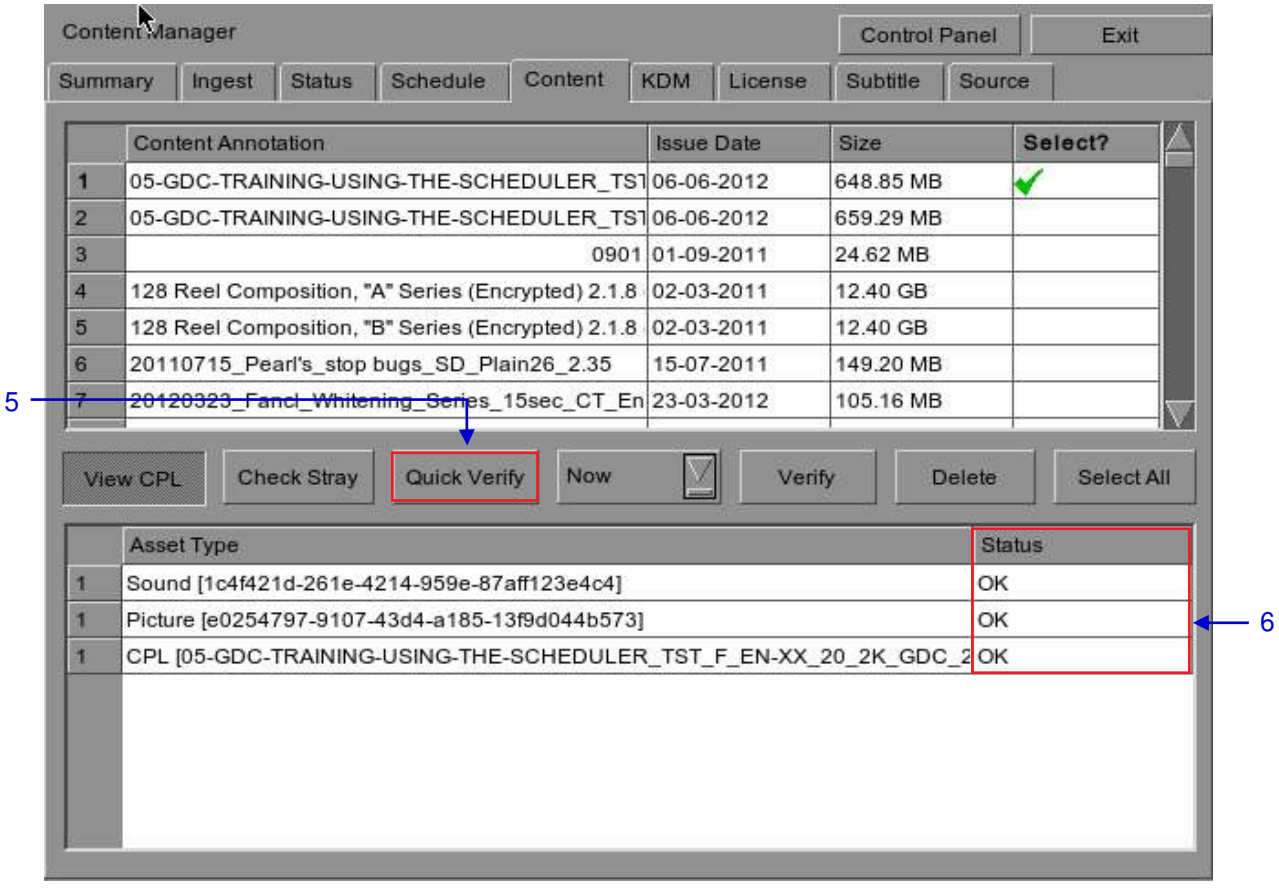


Figure 69 Package [Quick Verify]

5	Select Quick Verify to quickly check the integrity of the files in case it is modified or corrupted by calculating hash for each file in the selected package(s) or CPL(s).
6	You will see OK under the Status column after verifying that no problems are detected. If errors are found, the description of the error will be shown instead as seen in Figure 66 above. ***NOTE**: If there is an error in the selected package, it will indicate Failed under the Status column.*

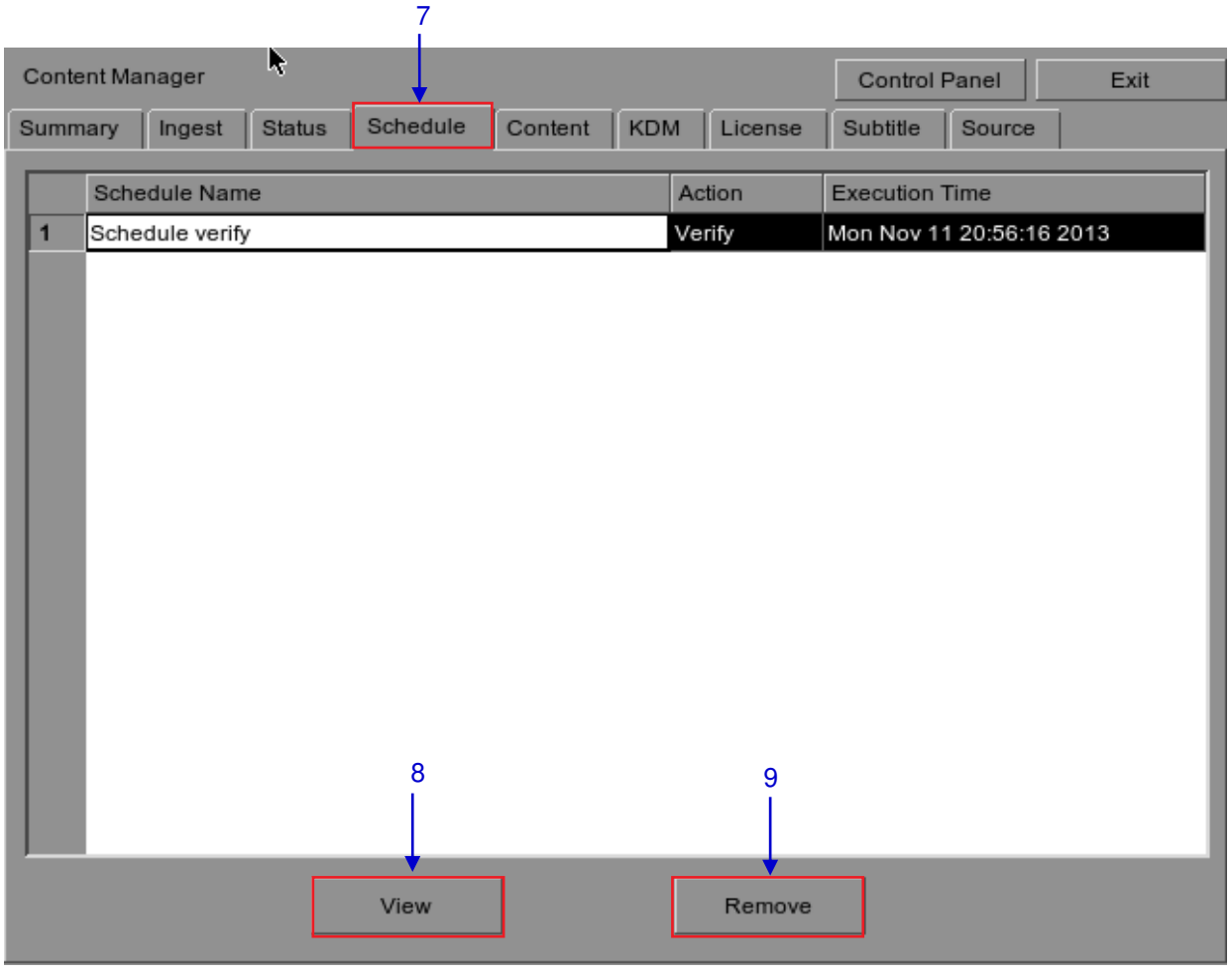


Figure 70 Content Manager [Schedule].

7	You can view the list of package(s)/CPL(s) that you have scheduled for verification by selecting the Schedule option.
8	Select the desired package or CPL and press View to see its schedule details.
9	Select the desired package or CPL and press Remove to delete it from the schedule list.

4.3. KDM Management

4.3.1. Manage KDM

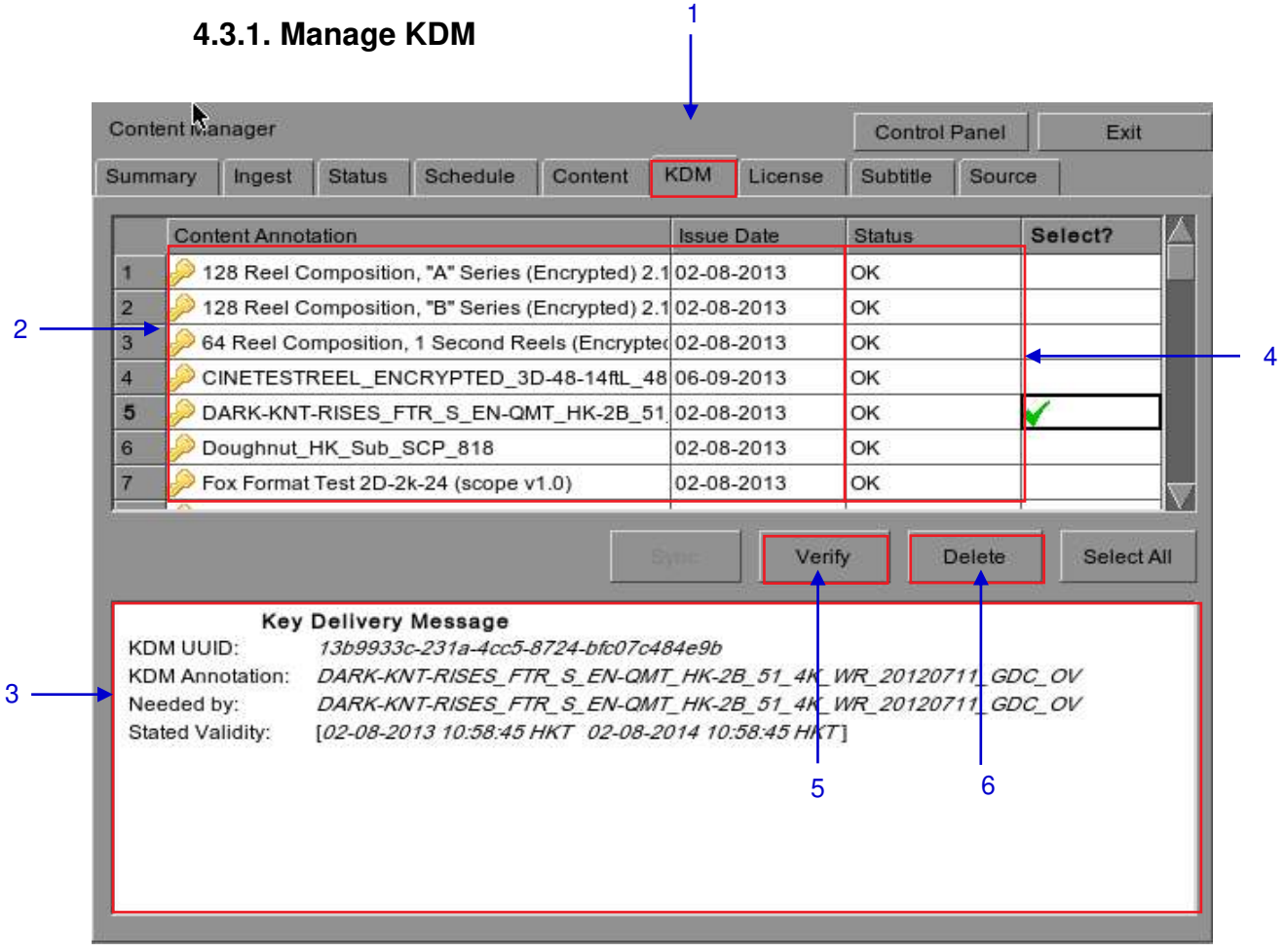


Figure 71 KDM Manager.

1	Select the KDM tab in the Content Manager
2	Show the KDMs present in the selected directory that are valid for this IMB.
3	Show the details of the selected KDM, including target, CPL, UUID and date of validity.
4	Display date of issue for KDM.
5	Verify the integrity of the KDM.
6	Delete removes KDM from the IMB.

4.4. License Management

4.4.1. Manage Licenses

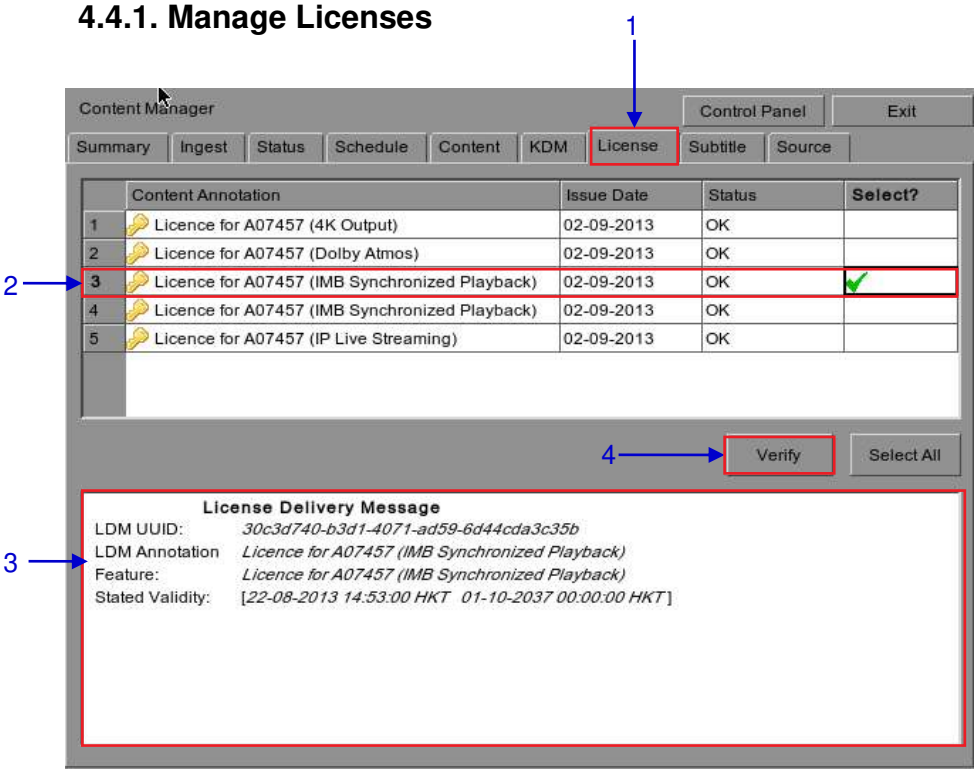


Figure 72 License Manager.

1	Select the License tab in the Content Manager.
2	Shows the licenses that are valid for this system.
3	Shows the details of the selected license, including licensed feature and validity period.
4	Verify the integrity of the selected license.

4.4.2. Ingesting Licenses

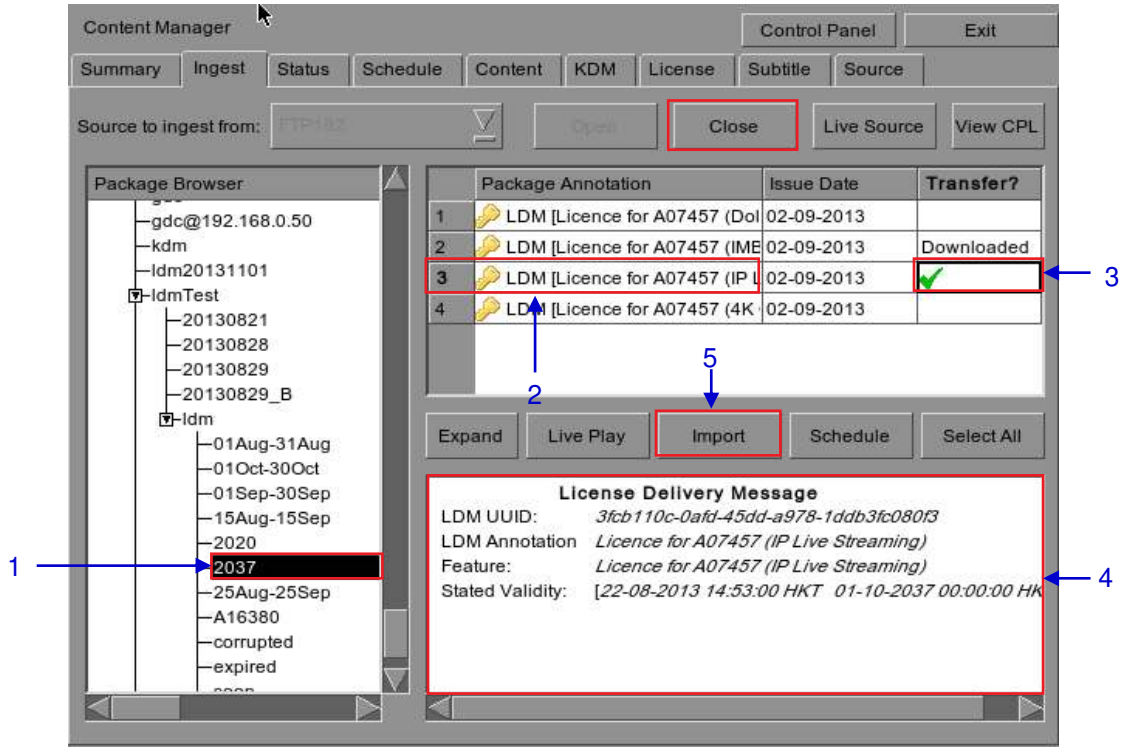


Figure 73 Ingesting license from a directory in the selected source.

1	Select the directory in the selected source where the license is located.
2	Shows the licenses present in the selected directory that are valid for this IMB.
3	Click under the Transfer column to select the license you wish to download. A green check ✓ indicates the selected license.
4	Shows the details of the selected license, including feature and date of validity.
5	Press Import to start the import of the license. The green check will change to Queued.
6	When done selecting the license, press Close to close the Package Browser.

4.4.3. Monitor Ingest Progress

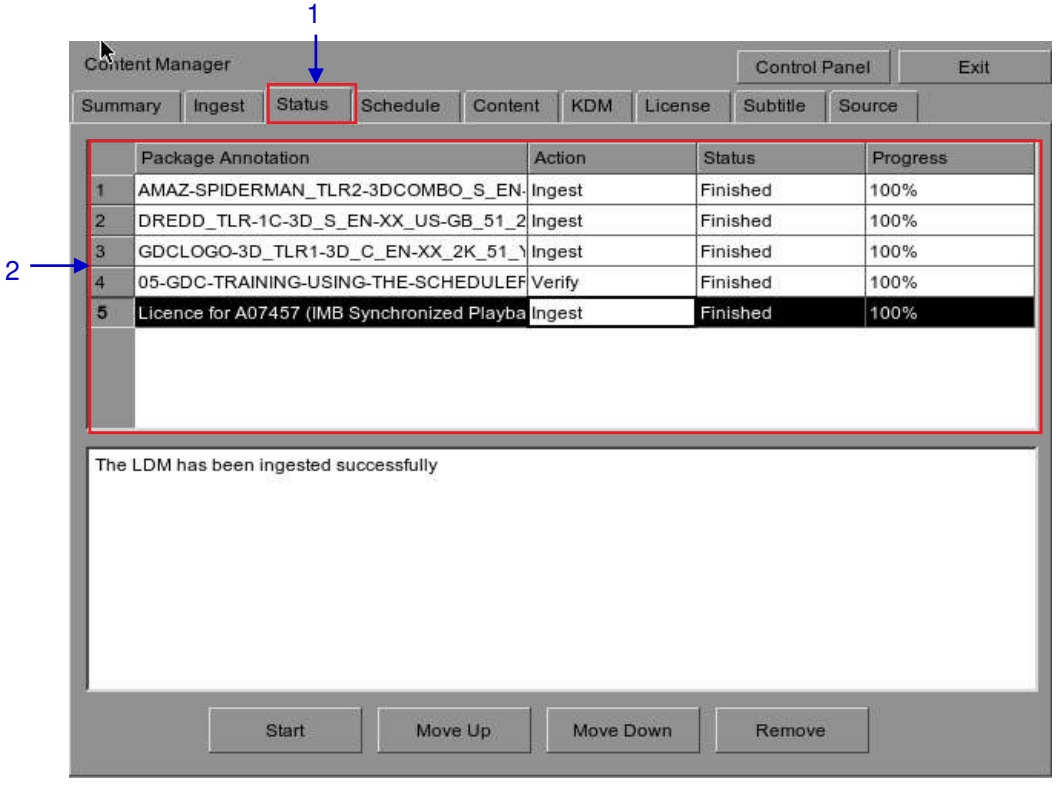


Figure 74 Monitor the progress of download of the packages.

1	Select the Status option.
2	Shows the download status of the packages or CPLs. In this example, downloading of some LDMs is complete.

4.5. Source Management

4.5.1. Adding a Data Source

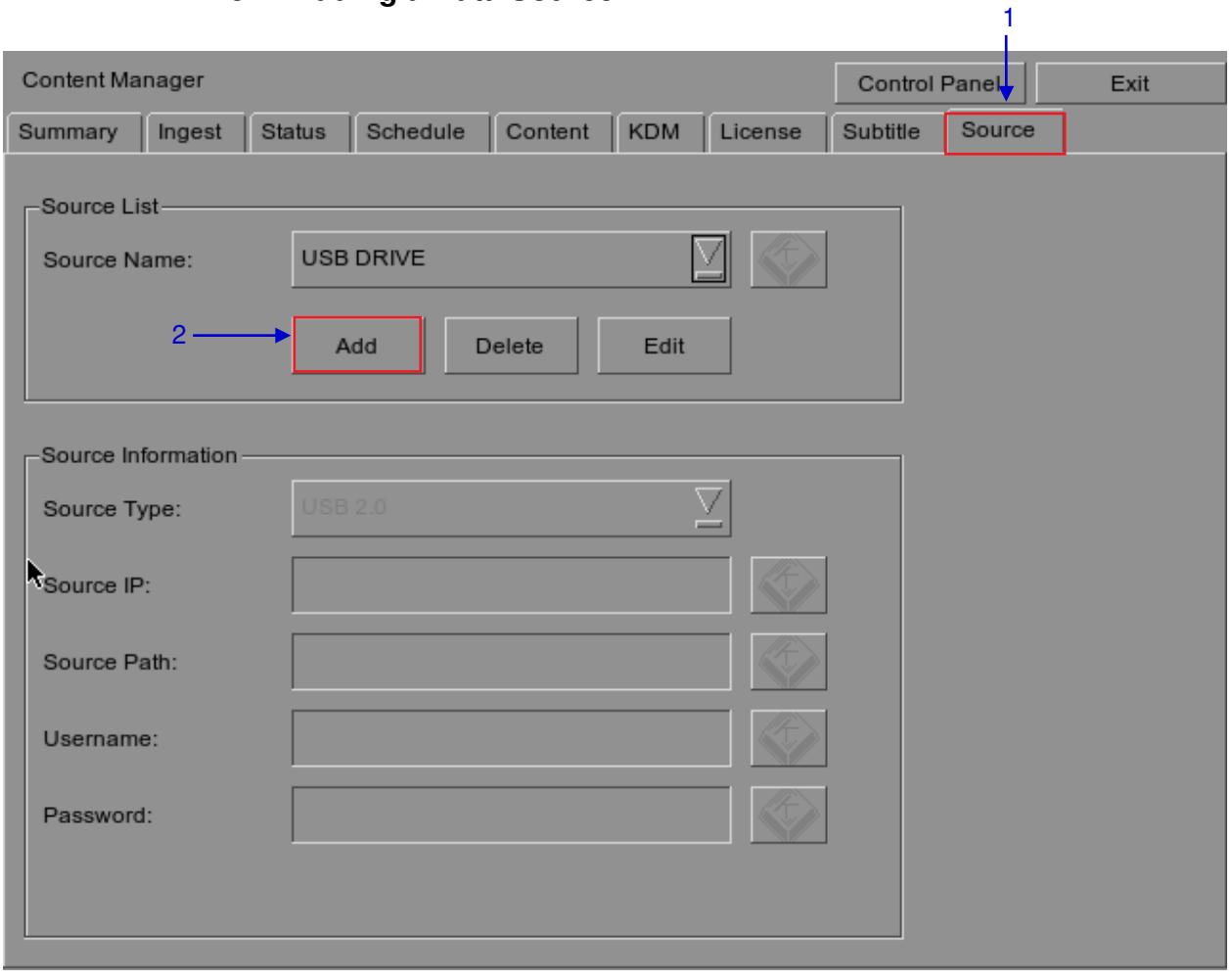


Figure 75 Content Manager [Source].

1	You can add a new source or edit an existing source by selecting the Source option.
2	To add a new source, enable the source name entry and source information entry by pressing Add. The Add button will then change to the Save button as seen in **Figure 76** below.

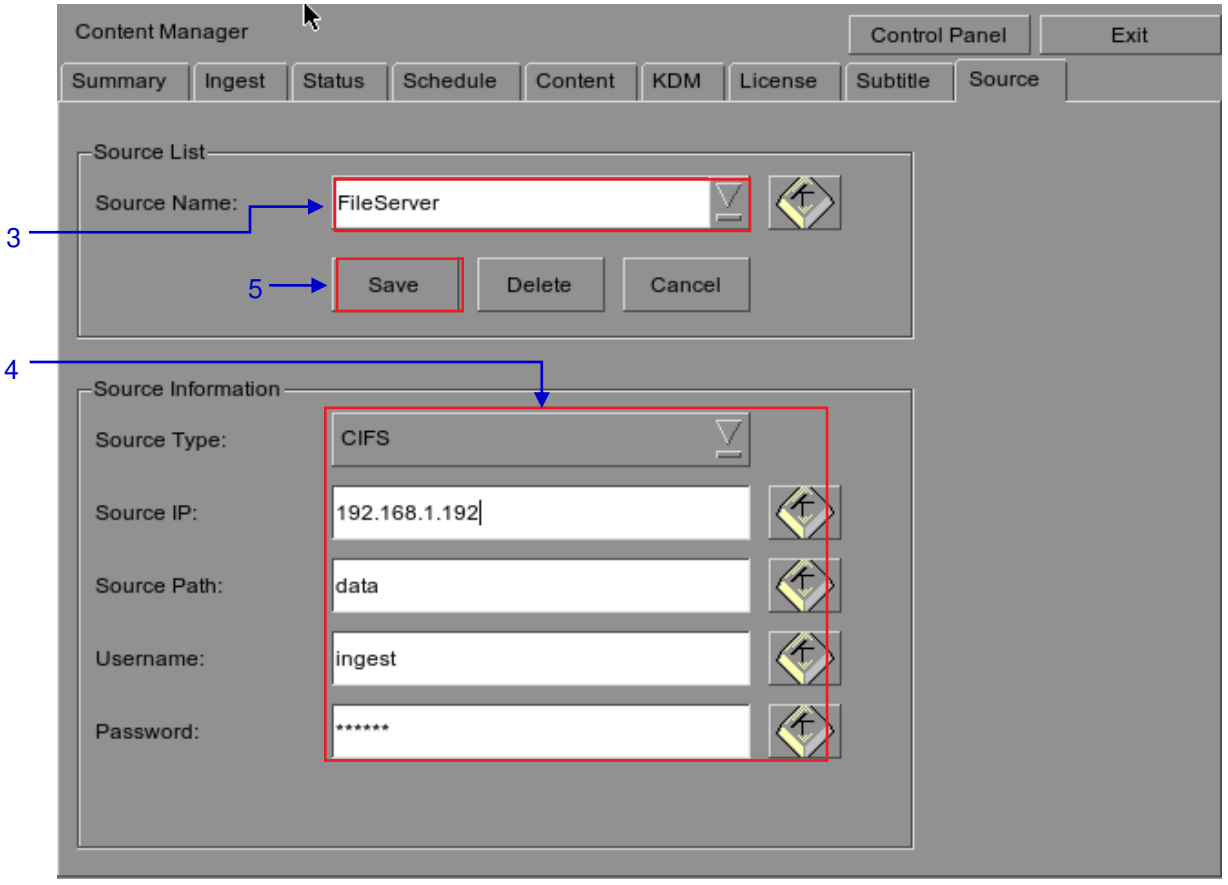
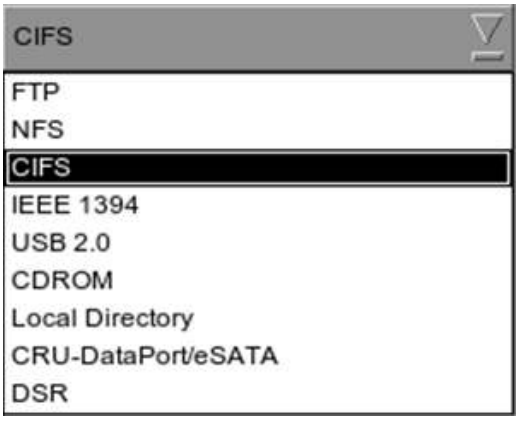


Figure 76 Content Manager – Setting the data source parameters.

3	Type in the new data source name on the Source Name entry. ***NOTE**: You can type on each entry using an external keyboard or by using the on-screen keyboard* . *The on-screen keyboard is normally used when an external keyboard is not present.*

4	Set the parameters of the source. Select the type of source from a dropdown list.  Type in the server name (source IP), source directory (source path), username and password of the selected source. ***NOTE:*** 1. For sources such as FTP and CIFS, the IP address, source path, username and password are enabled. The username and password are optional provided that the data source is not protected by username and password. For example, some window shares can be accessed without username and password, while other window shares need a username and password. 2. For source such as NFS, only the server name and directory are enabled. The username and password entries are disabled.
5	Press Save to save all settings.

4.5.2. Erasing a Data Source

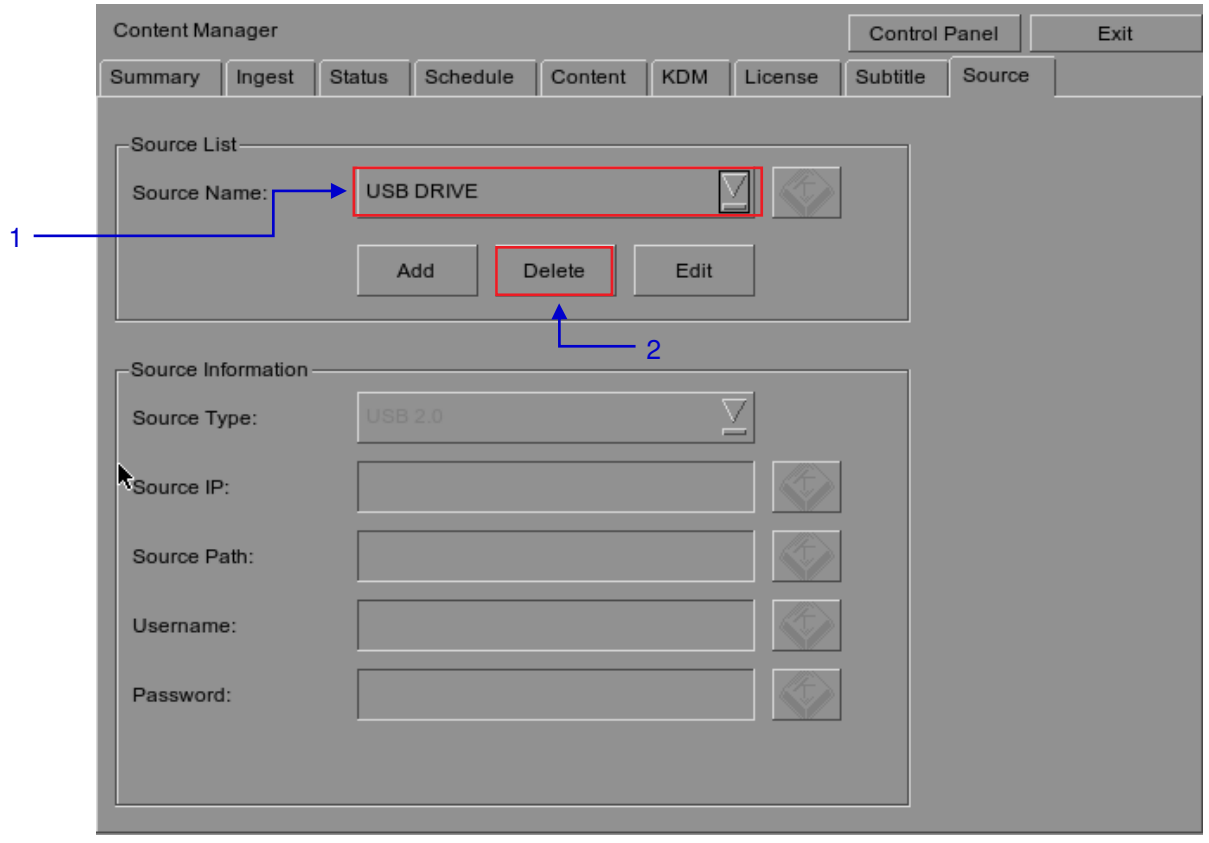


Figure 77 Deleting a previously saved data source.

1	Select the data source you want to delete from the dropdown list.
2	Press Delete to delete the selected data source.

4.5.3. Editing Sources

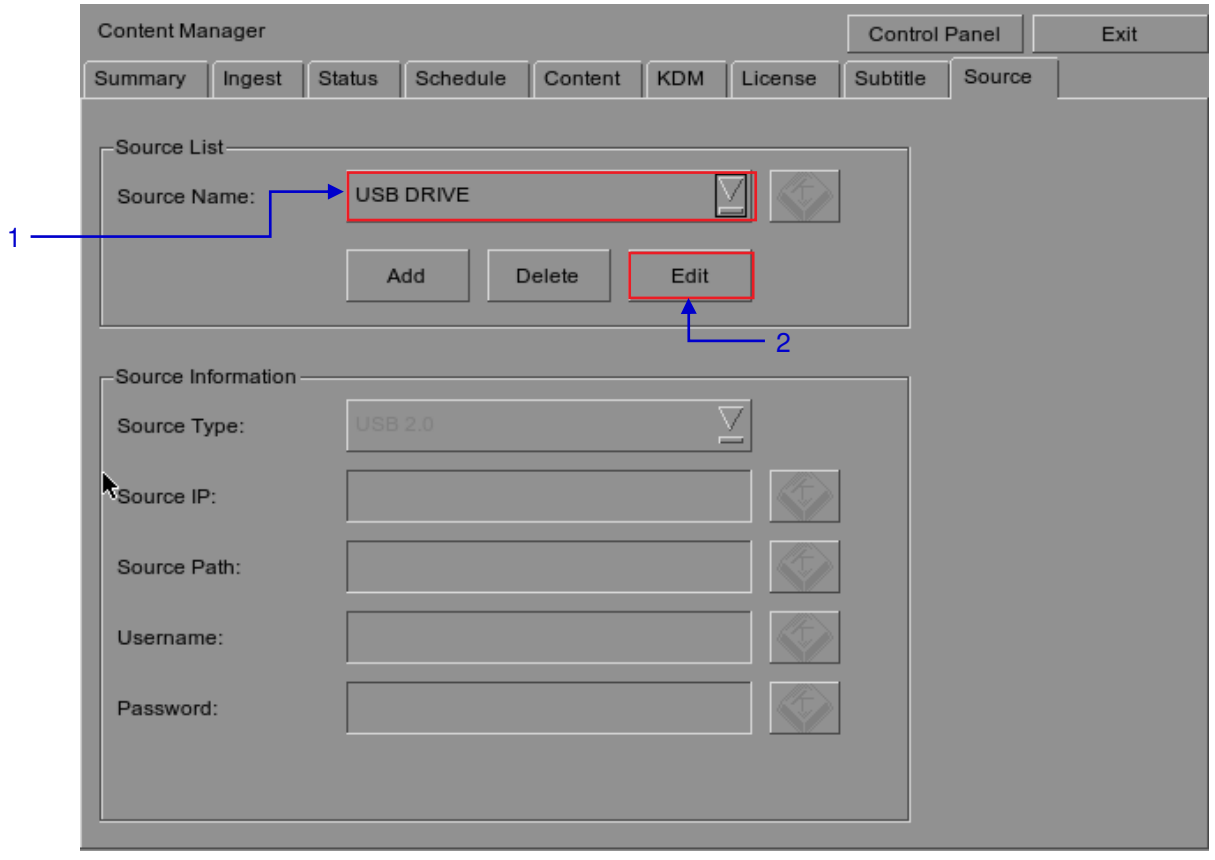


Figure 78 Editing a new data source.

1	To edit an existing source, select the data source you want to edit from the dropdown list.
2	Press Edit to edit the selected data source. Add and Edit buttons will change to Save and Cancel.

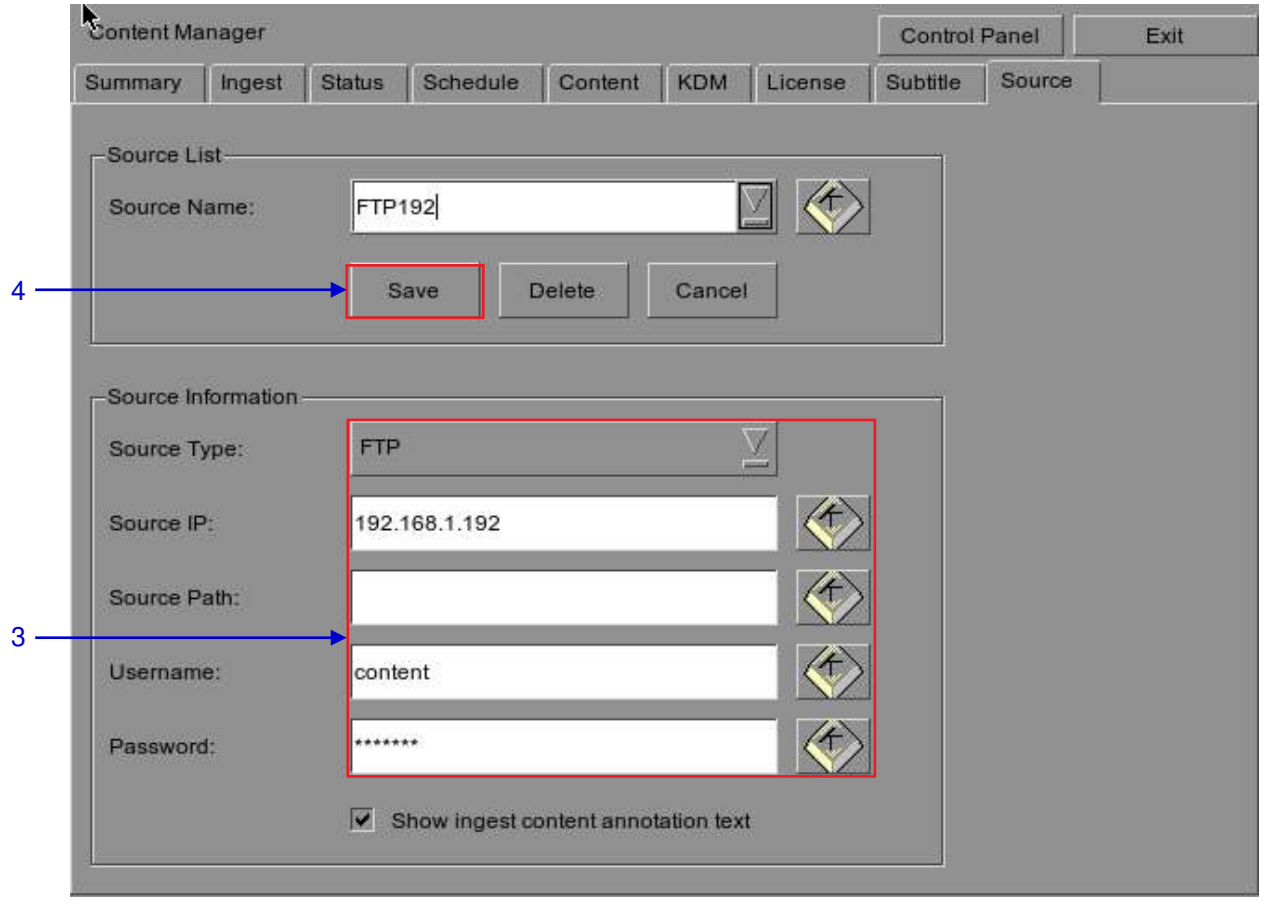


Figure 79 Editing the parameters of the selected data source.

3	You can edit/change the source name, parameter settings, username, or password by typing on each entry using an external keyboard or an on-screen keyboard . ***NOTE:*** *For more information regarding types of sources, please refer to* ***Figure 79****.*
4	Press Save after making all the changes.

5. ADMIN PANEL

5.1. General Introduction

Set Up and Configuration

The Admin panel is an easy-to-use and convenient software tool for the maintenance and configuration of GDC IMB. This Admin panel provides all the necessary tools for setting up and managing the IMB. A comprehensive array of easy to access menu pages are provided to simplify configuration and maintenance via a combination of simple buttons and an on-screen keyboard.

Secured Access

Clearly indicated button pages allow IMB network setup, maintenance and configuration, and access to software information. All actions can be performed by touching the drawn control on the screen of the IMB. Access to the Admin panel of the GDC IMB is available via the maintenance option and by entering a required password available from authorized GDC personnel only.

5.2. User Interface (UI)

5.2.1. Introduction

The Admin Panel UI provides access to the menu buttons and on-screen keyboard that are used for setting up and configuring the IMB. Diagnostic maintenance and/or monitoring of the status and performance of the IMB can also be done via the Admin Panel UI. Other information including hardware of the IMB can also be accessed through the Admin Panel UI. It also enables configuration of the timezone and selection of the touchscreen type of the IMB.

5.2.2. Access to Admin Panel

5.2.2.1. Access via Control Panel

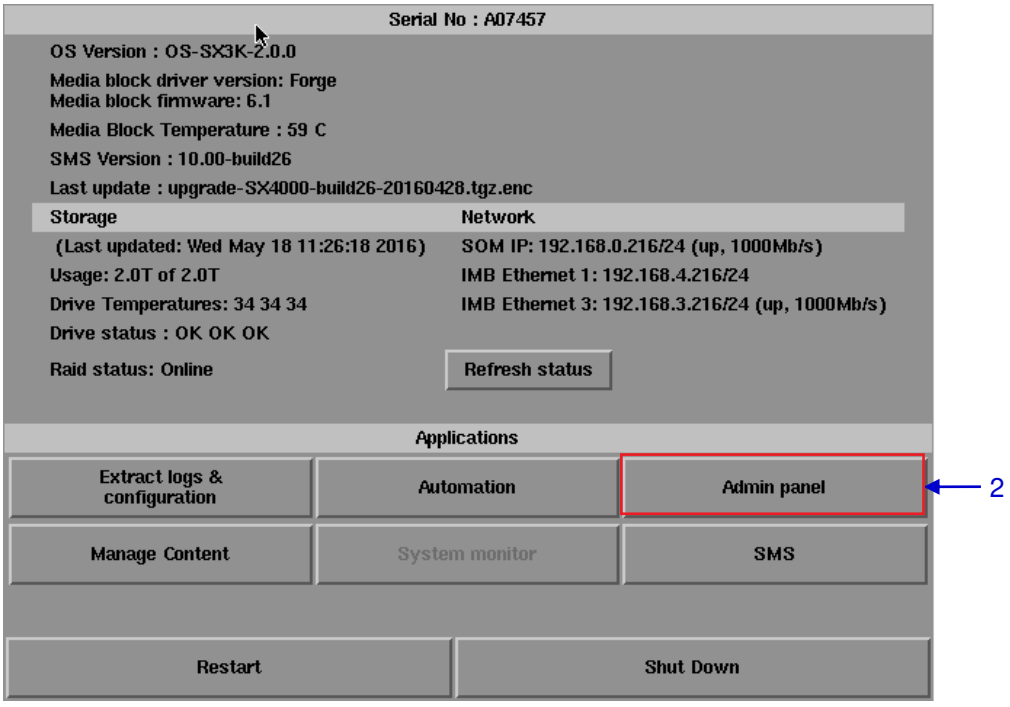


Figure 80 SX-4000 Control Panel.

1	Press Control Panel on the SMS interface.
2	Click on the Admin panel button to go to the startup window for Admin Panel as seen in **Figure 81.**

5.2.2.2. Login to Admin Panel

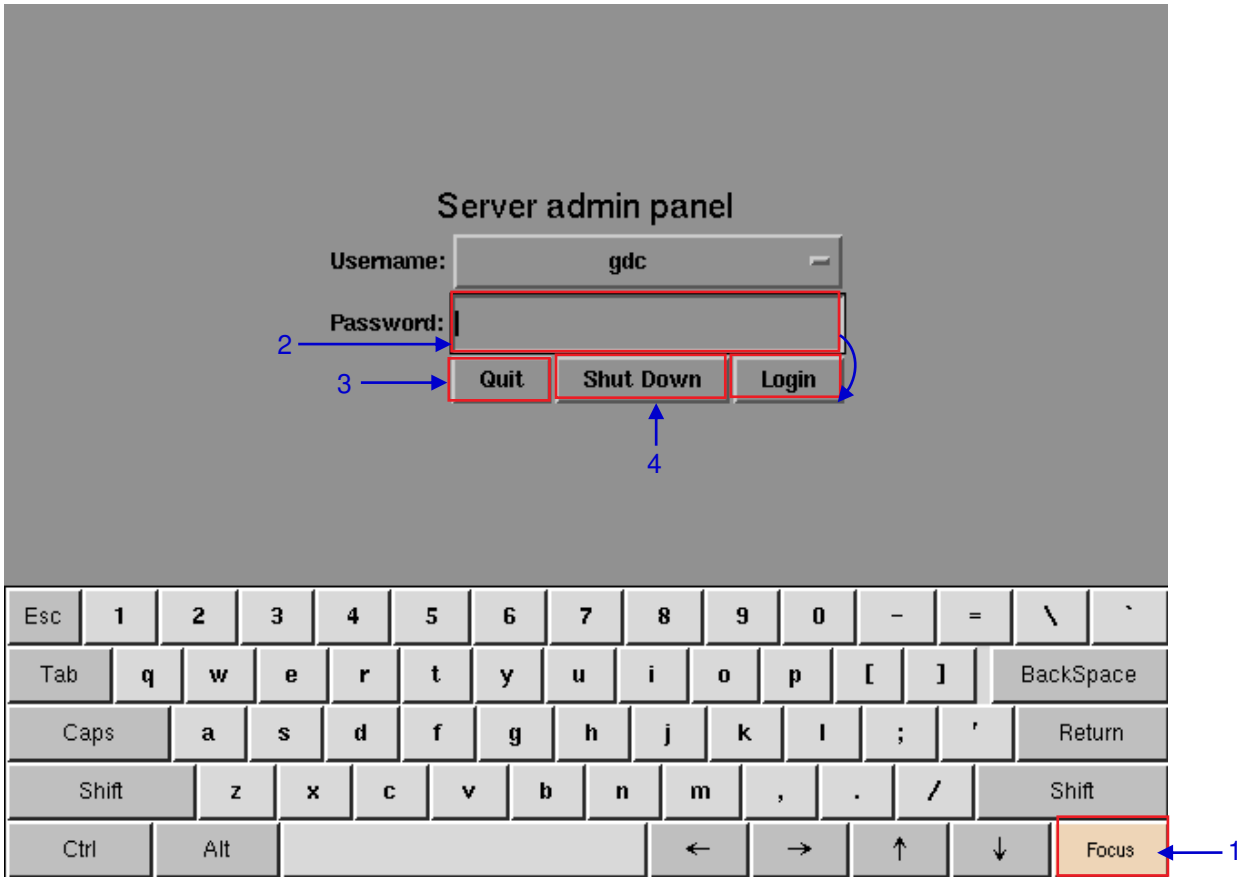
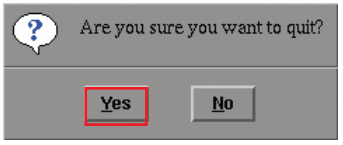
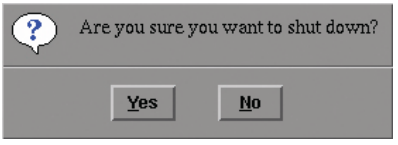


Figure 81 Entering the password for Admin Panel SMS interface.

1	Click on Focus. Clicking on Focus once before you start typing enables what you type in the onscreen keyboard to go into a specific window. Without focusing on the particular window, text will not appear even if you type something. Click Focus again only when necessary.
2	Click on the password entry on the screen and type in the required password using the on-screen keyboard and then press Login to access the Admin Panel SMS interface. ***NOTE:*** *The password is available from GDC authorized personnel only.*

3	Select Quit if you wish to go back to Control Panel. A small window pops out to confirm the selection.  Press Yes to confirm.
4	Select Shut Down if you wish to shut down the IMB. A small window pops up to confirm the selection.  Press Yes to confirm.

5.2.2.3. SMS Interface

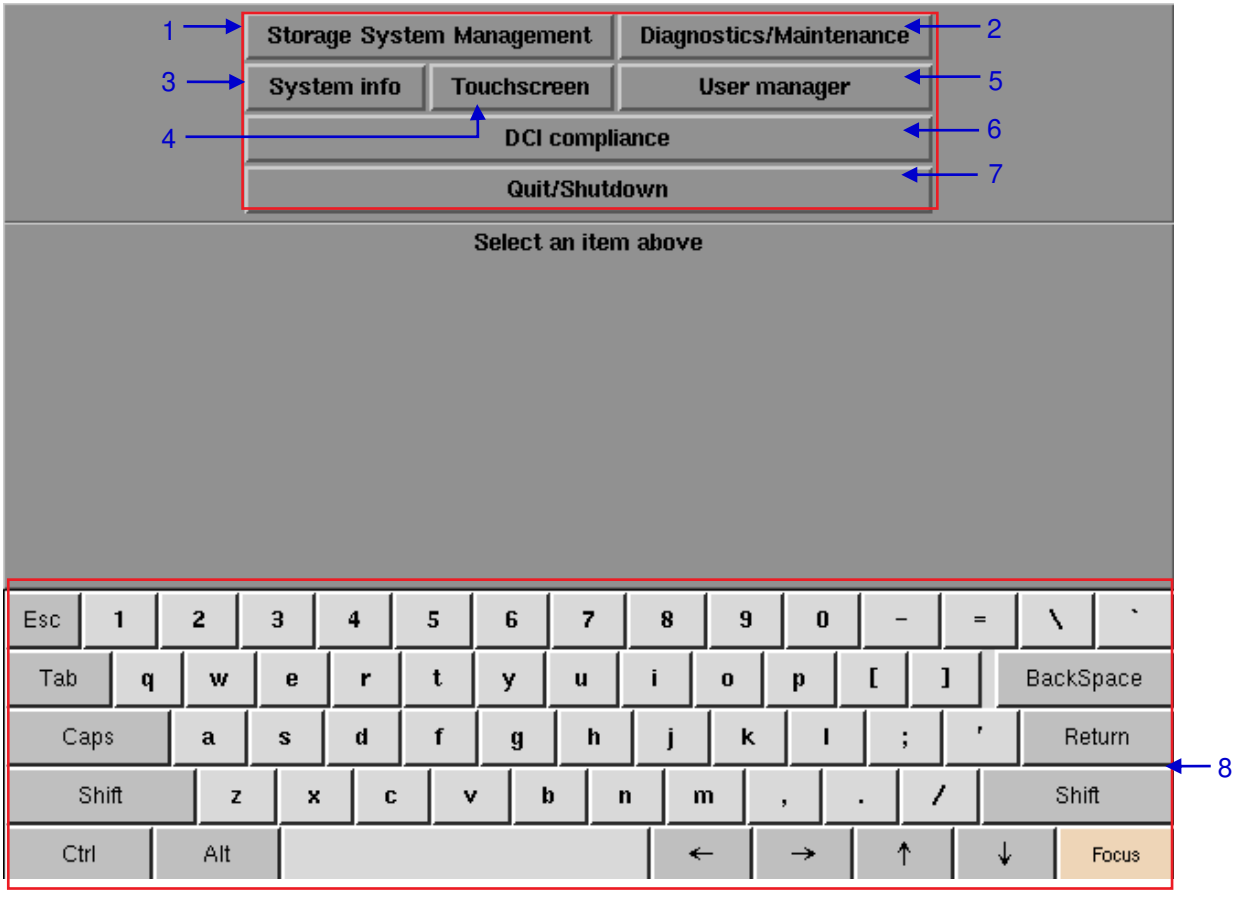


Figure 82 A d m i n Panel

1	**Storage System Management**	For creating a new RAID array and monitoring the RAID array status. Also shows hard disk information, hard disk usage, storage performance and increase rebuild speed.
2	**Diagnostics/Maintenance**	For changing timezone, and extracting logs and configuration backups from the IMB.
3	**System Info**	Shows OS version, licensing, hardware and hotfix information.
4	**Touchscreen**	For selecting touchscreen type and calibrating the touchscreen.
5	**User Manager**	For adding/editing/deleting username, and for changing current user password.
6	**DCI Compliance**	For accessing the RTC clock to make time adjustments as well as extracting the Security Manager logs from the IMB.
7	**Quit/Shutdown**	For switching to SX-4000 SMS interface, for shutting down the IMB and restart all services.
8	**On-screen keyboard**	For keying in text when not using an external keyboard.

5.3. Configuration & Maintenance

5.3.1. Storage System Management

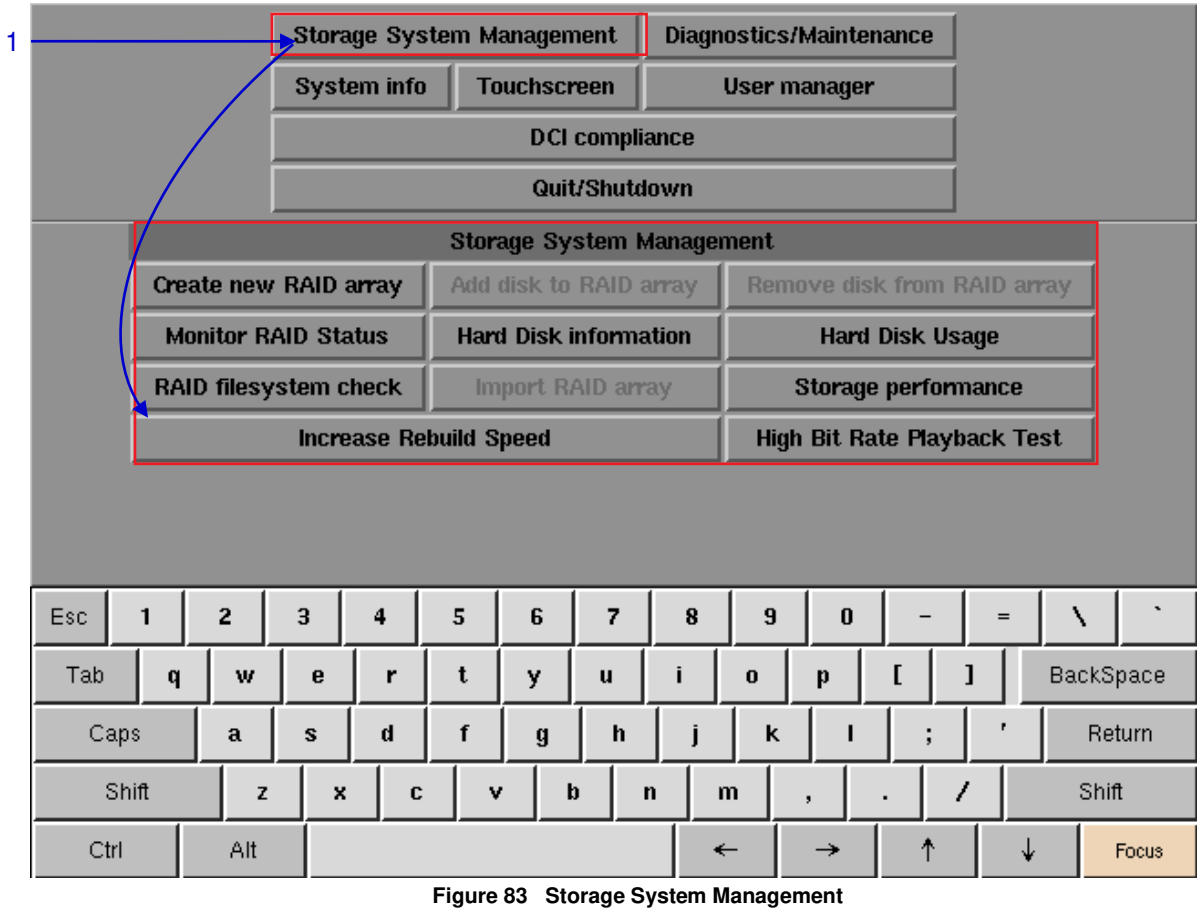


Figure 83 Storage System Management

1	Select Storage System Management. A small window for Storage System Management pops up.

5.3.1.1. Create new RAID array

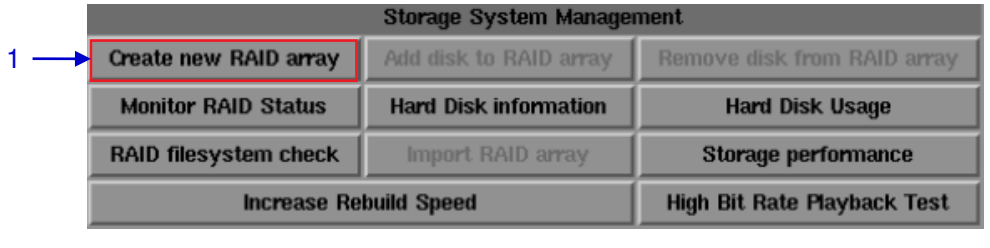


Figure 84 Storage System Management [Create new RAID array].

1	Select Create new RAID array. A new window appears as seen in **Figure 85**.

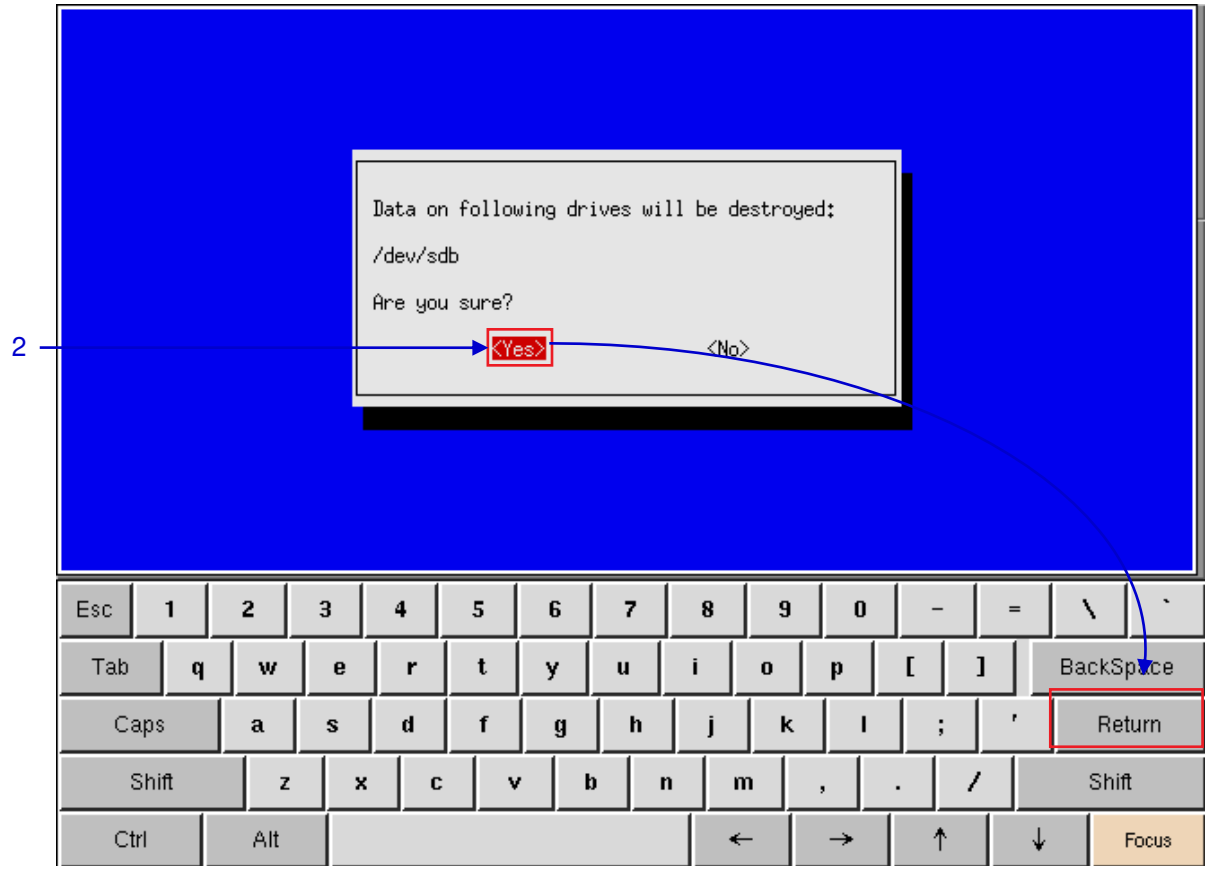
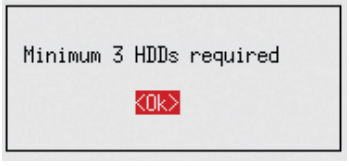


Figure 85 Confirming to destroy data on the drive

2	Select Yes or No to confirm or cancel the selection by clicking the right [➔] or left [🡐] arrow keys on the on-screen keyboard and then click Return.
3	If less than three (3) hard disks are inserted to the PSD, a small dialog box will pop up:  Click Return on the on-screen keyboard to exit and return to Storage System Management.

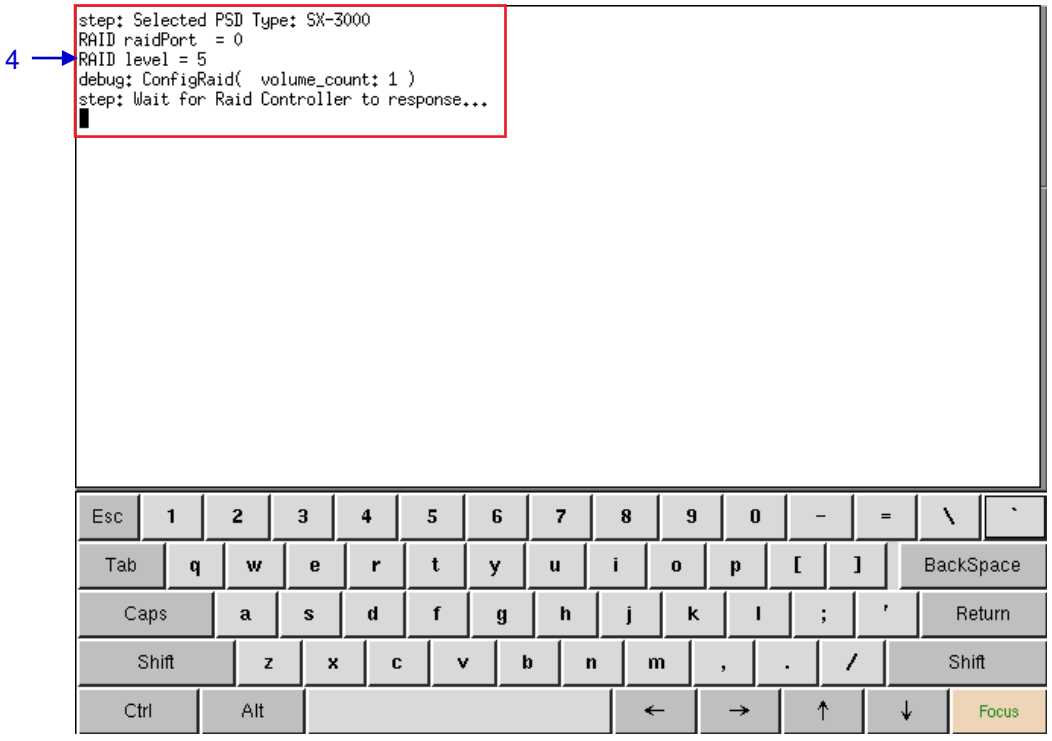


Figure 86 RAID creation progress.

6	The RAID creation progress is shown on the screen.
7	After the RAID is created, the following dialog box is shown. Use SMS➔ Configuration ➔ IMB Storage (please refer to **Section 2.3.4.7.)** to mount the RAID.

5.3.1.2. Monitor RAID Status

Figure 87 Storage System Management [Monitor RAID status].

1	Select Monitor RAID Status. When the RAID is rebuilding, it displays the rebuilding progress as normal function to the previous RAID setup. A new window appears as seen in **Figure 88**.

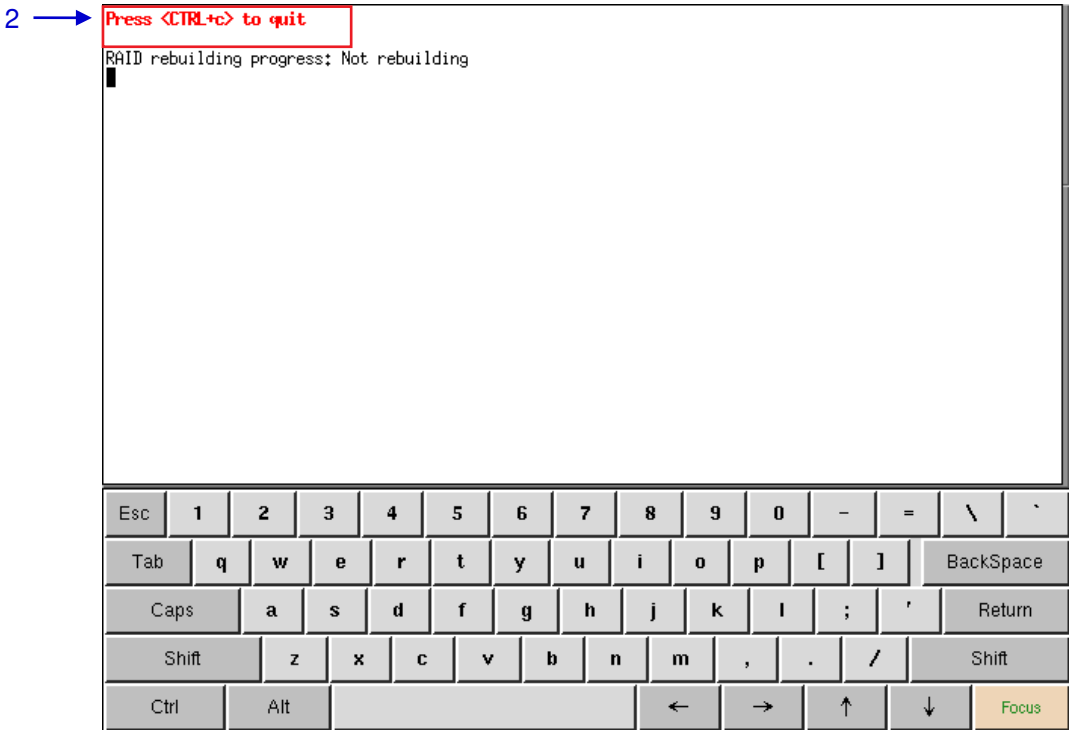


Figure 88 Status of active RAID in the IMB.

2	Press <CTRL + c> to quit and return to the Storage System Management.

5.3.1.3. Hard Disk Information

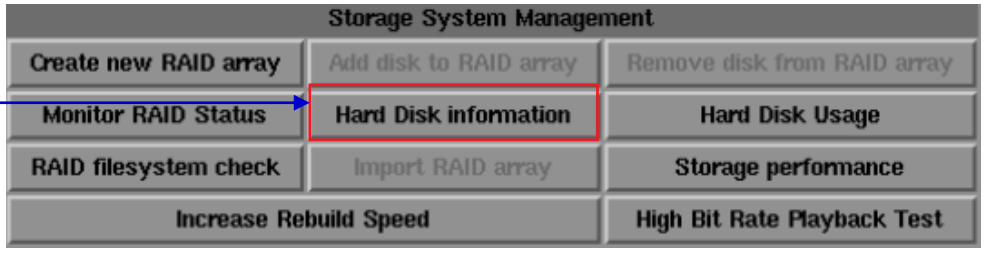


Figure 89 Storage System Management [Hard Disk Information].

1	Select Hard Disk Information. A new window appears as seen in **Figure 90.**

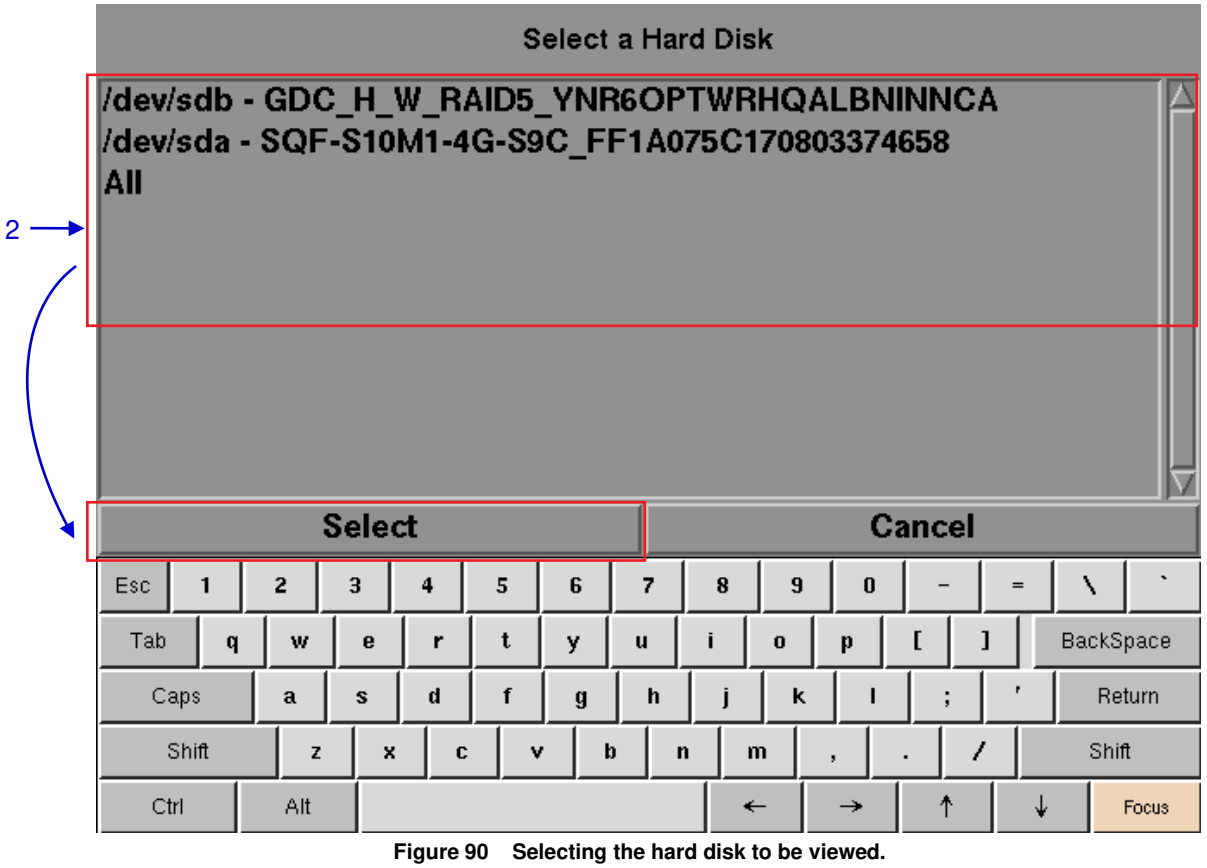


Figure 90 Selecting the hard disk to be viewed.

2	Select the disk you want to view the information from and press Select.
3	A new window will show the information for the selected disk as seen in **Figure 91**. Press Save output to USB to save a screenshot of the information to a USB disk. Click Back to return to Storage System Management.

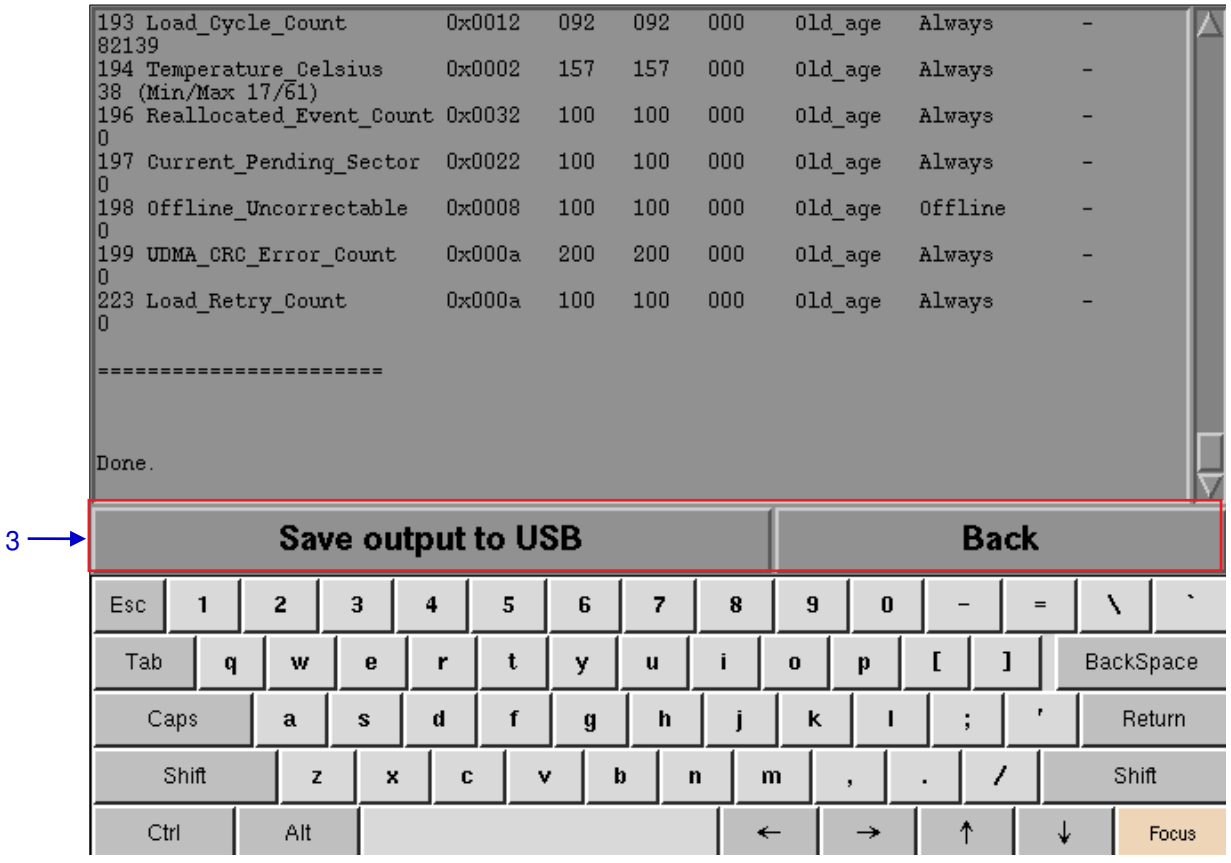


Figure 91 List of information for selected hard disk.

5.3.1.4. Hard Disk Usage

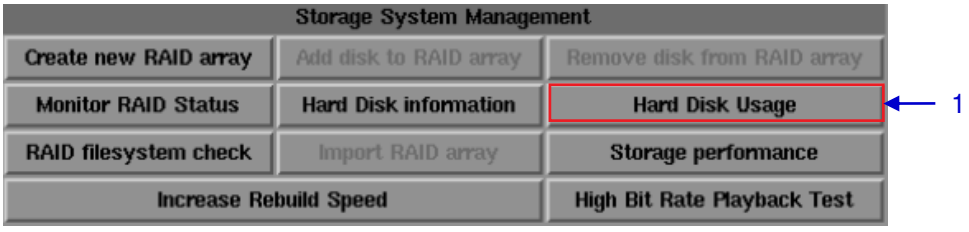


Figure 92 Storage System Management [Hard Disk Usage].

1	Select Hard Disk Usage from Storage System Management.
2	A new window showing hard disk usage appears as seen in **Figure 93**. Click Back to return to the Storage System Management.

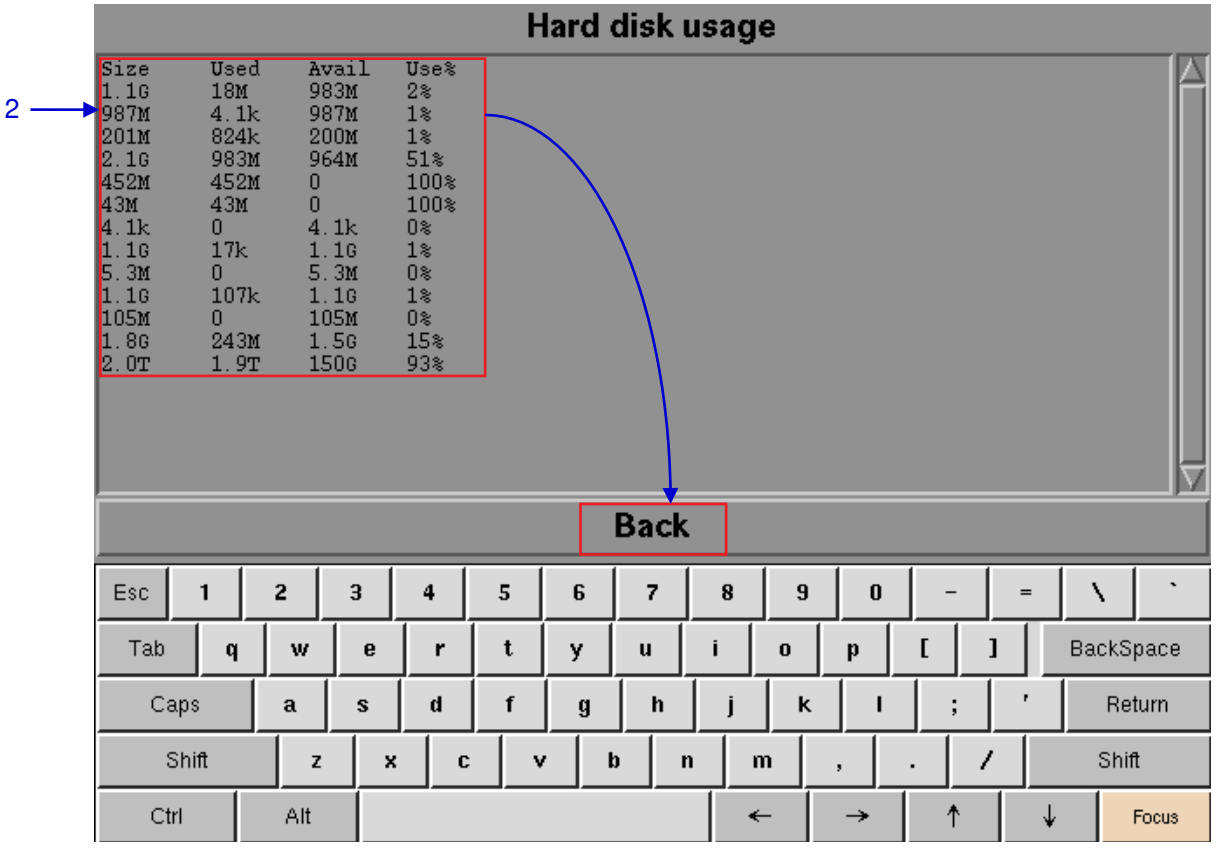


Figure 93 Size of the hard disk, and the used and available spaces in the hard disk.

5.3.1.5. Storage Performance

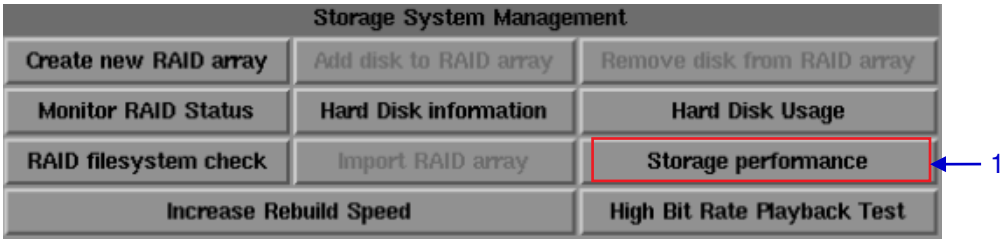


Figure 94 Storage System Management [Storage performance].

1	Select Storage performance. A new window showing a list of hard disks appears as shown in **Figure 95**.
2	Select the hard disk you want to view and press Select to execute the process.

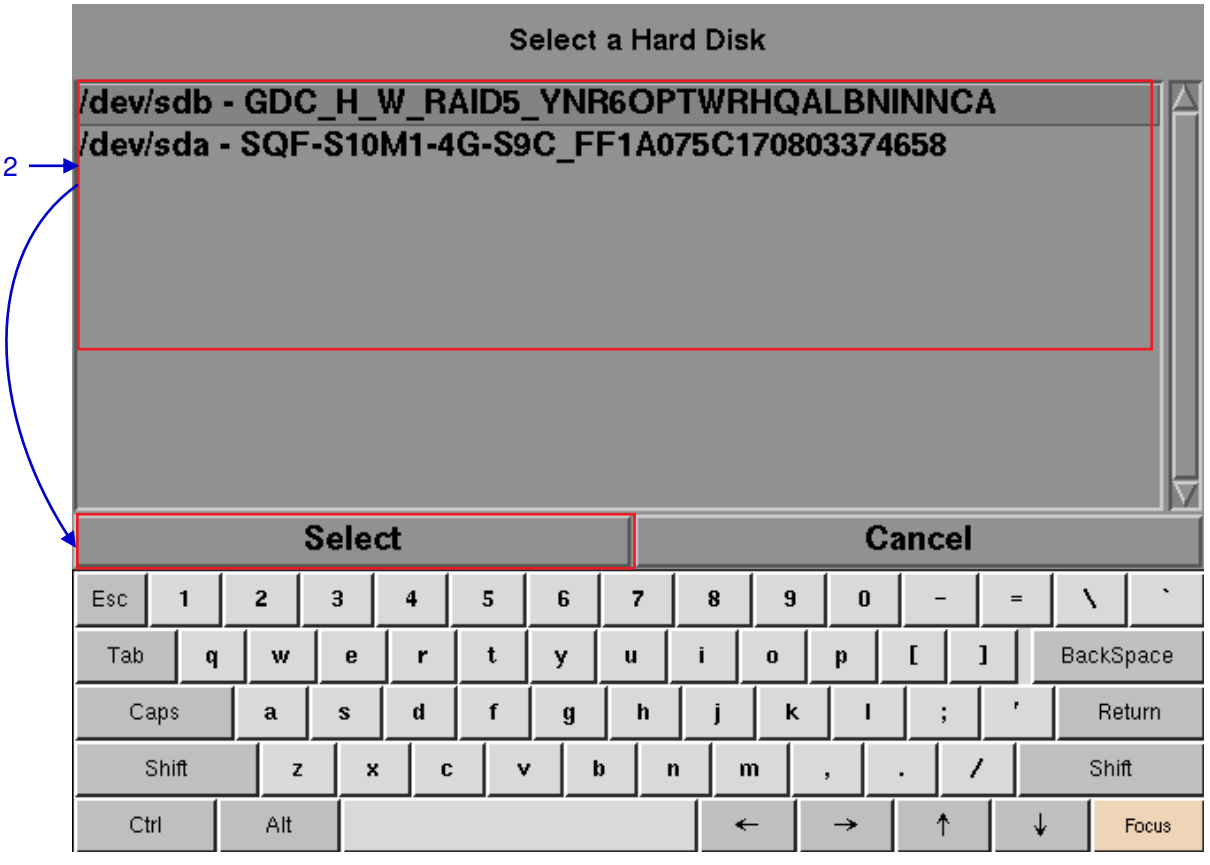


Figure 95 Storage performance [Select a Hard Disk].

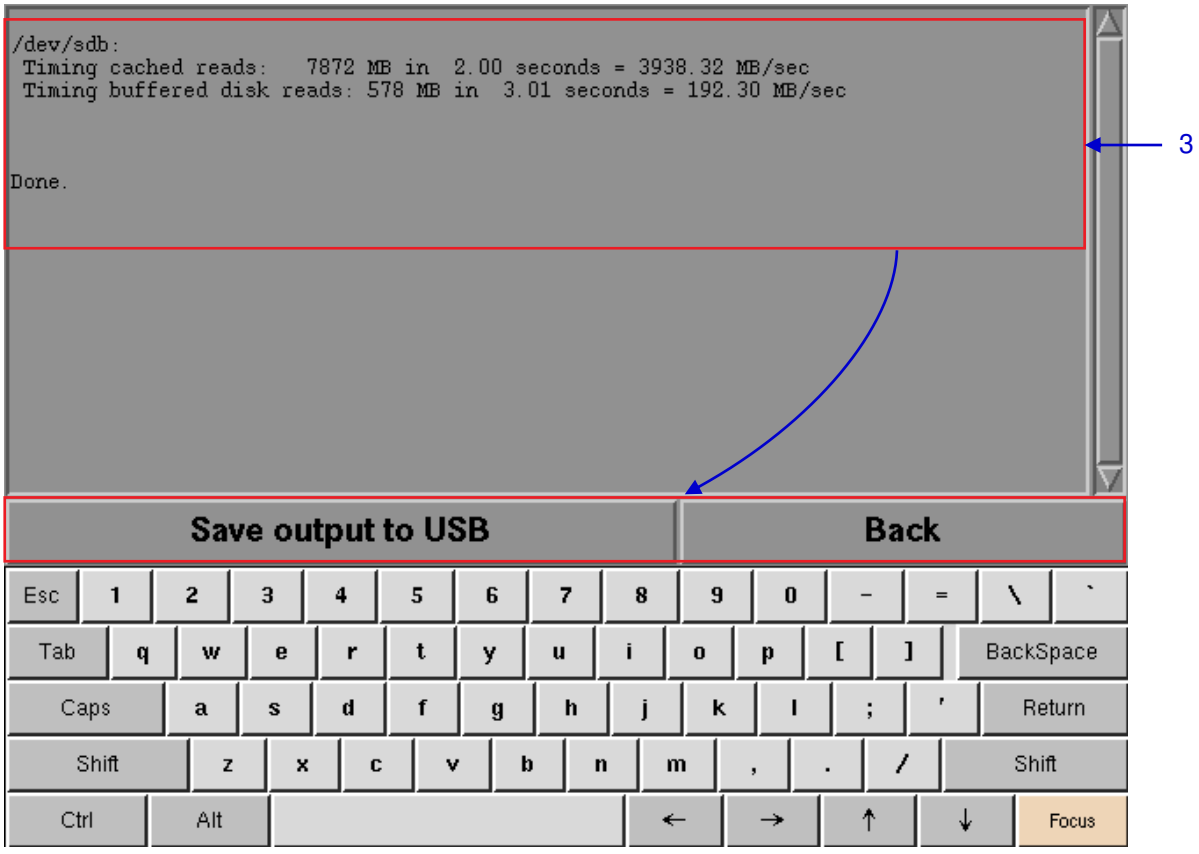


Figure 96 Shows information on storage performance of the selected hard disk.

3	A new window showing information on hard disk performance appears as seen in **Figure 96**. Press Save output to USB to save this information to a USB disk. Press Back to return to Storage System Management.

5.3.1.6. Increase Rebuild Speed

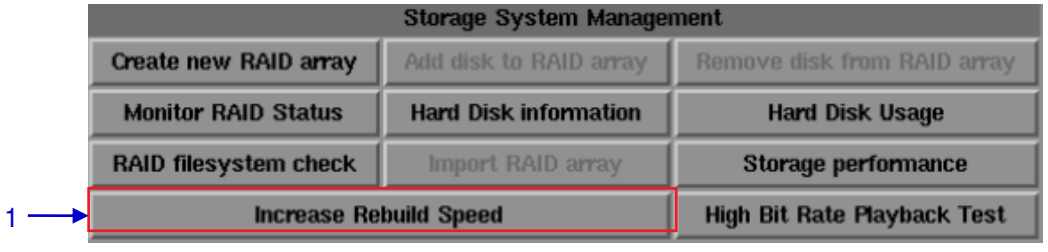


Figure 97 Storage System Management [Increase Rebuild Speed].

1	If the RAID array is being rebuilt during playback, the rebuild speed will slow down significantly. To resume highest rebuild speed after playback is finished, go to Admin Panel➔ Login ➔ Click Storage System Management ➔ Click Increase Rebuild Speed button (please refer to **Figure 97**). This will immediately set RAID array to rebuild at highest speed.

5.3.2. Diagnostics/Maintenance

5.3.2.1. Access to Diagnostics/Maintenance

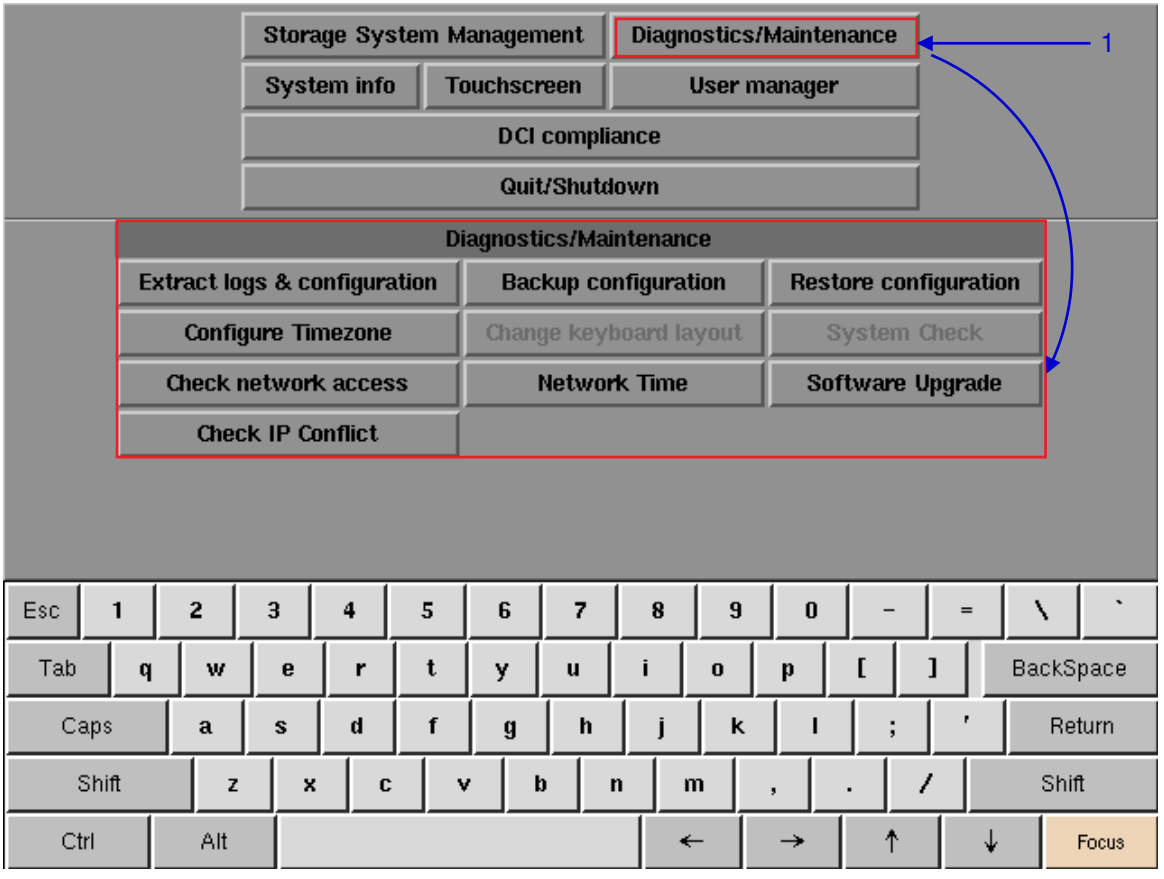


Figure 98 Diagnostics/Maintenance

1	On the Main menu, select Diagnostics/Maintenance. A small window for Diagnostics/Maintenance appears.

5.3.2.2. Extract Logs & Configuration

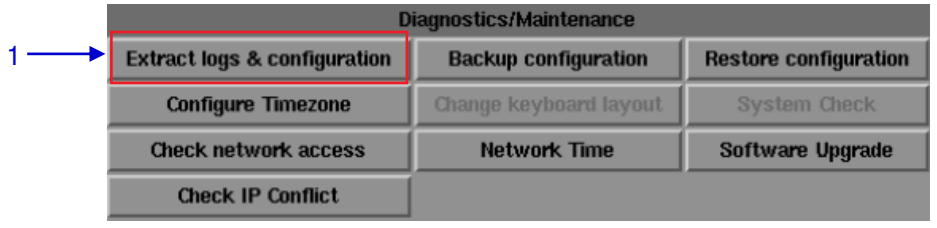
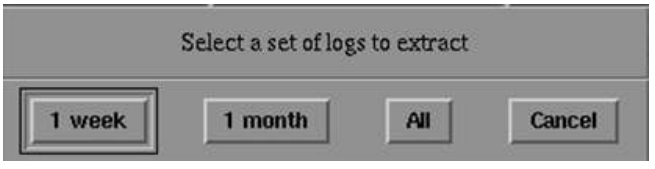
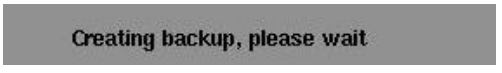
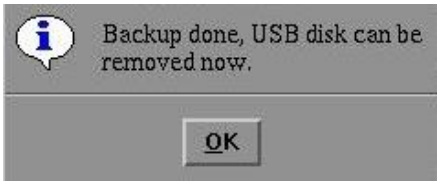


Figure 99 Diagnostics/Maintenance [Extract logs].

1	Select Extract logs. Select the set of logs required on this dialog box. A pop-up window will be shown indicating that the log extraction is in progress.  
2	Once extract log files finished, a new window showing backup done is appeared. The USB can be removed. 

5.3.2.3. Backup Configuration

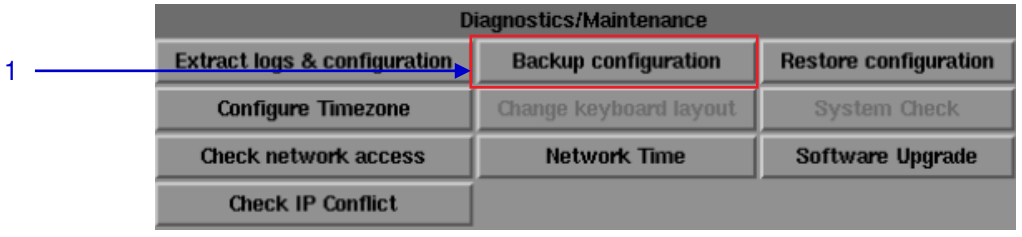


Figure 100 Diagnostics/Maintenance [Backup configuration].

1	The Backup Configuration saves the IMB configuration to a backup file on a USB disk or thumb drive. Attach a USB thumb drive to the IMB and select Backup Configuration to save the current IMB configuration.

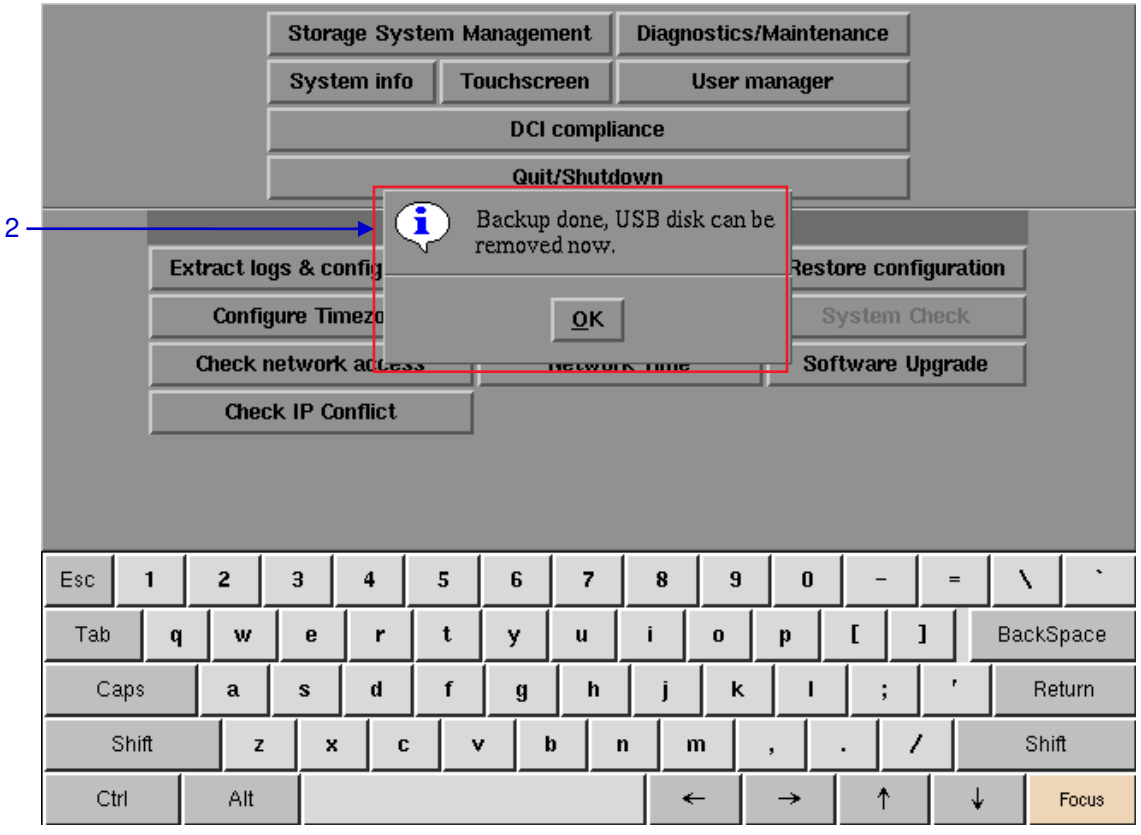


Figure 101 Saving IMB configuration

2	The backup file is saved in an encrypted format as seen in **Figure 101**. The following configuration files are included in the backup file: • Automation configuration • SNMP configuration • SMS configuration • Content manager source configuration • Network Time Protocol (NTP) configuration • System user interface passwords • Show Playlists

5.3.2.4. Restore Configuration

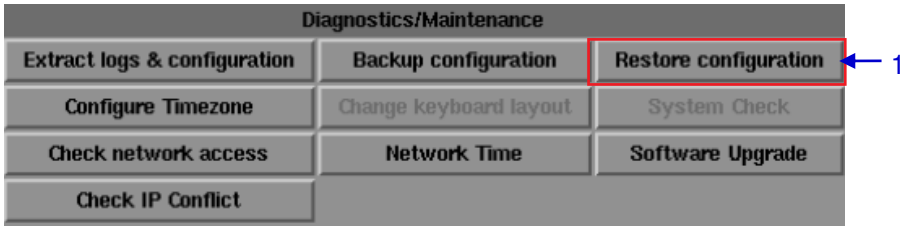


Figure 102 Diagnostics/Maintenance [Restore configuration].

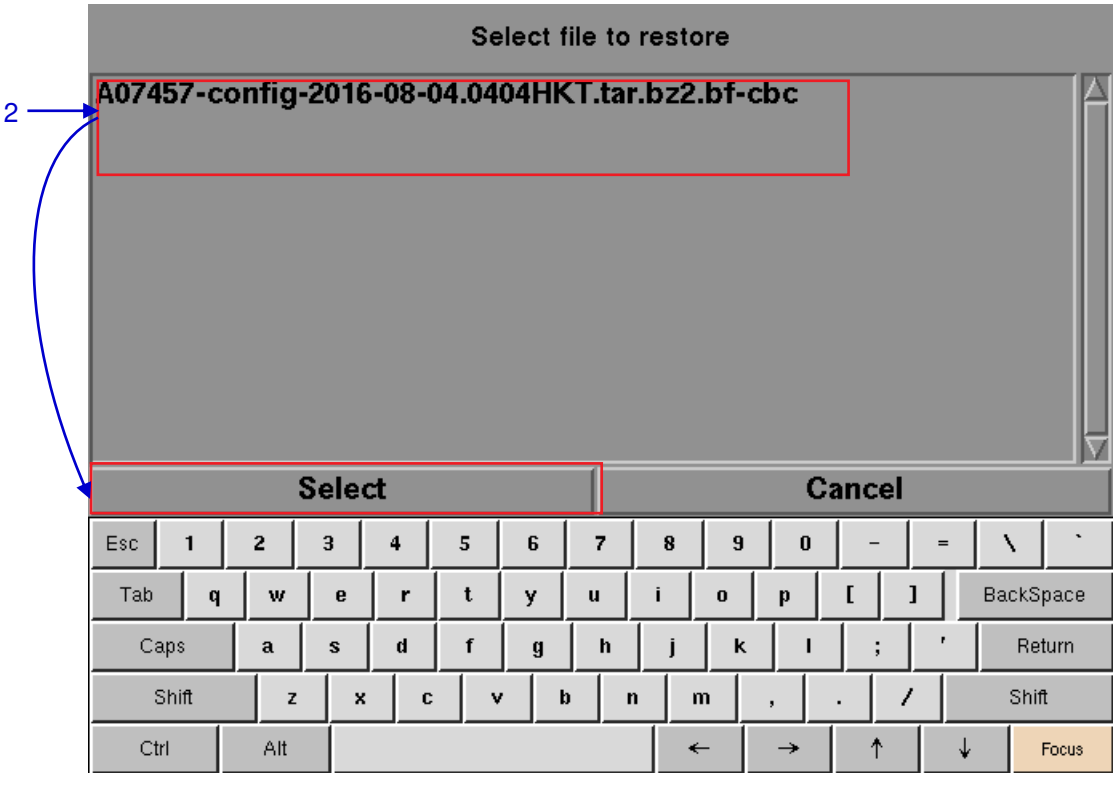


Figure 103 Select file to restore.

2	Restore Configuration will restore the IMB configuration from a backup file on a USB disk or thumb drive. When Restore Configuration is pressed, a list of backup files present on the USB disk is displayed. Select the backup file to restore and then press Select.

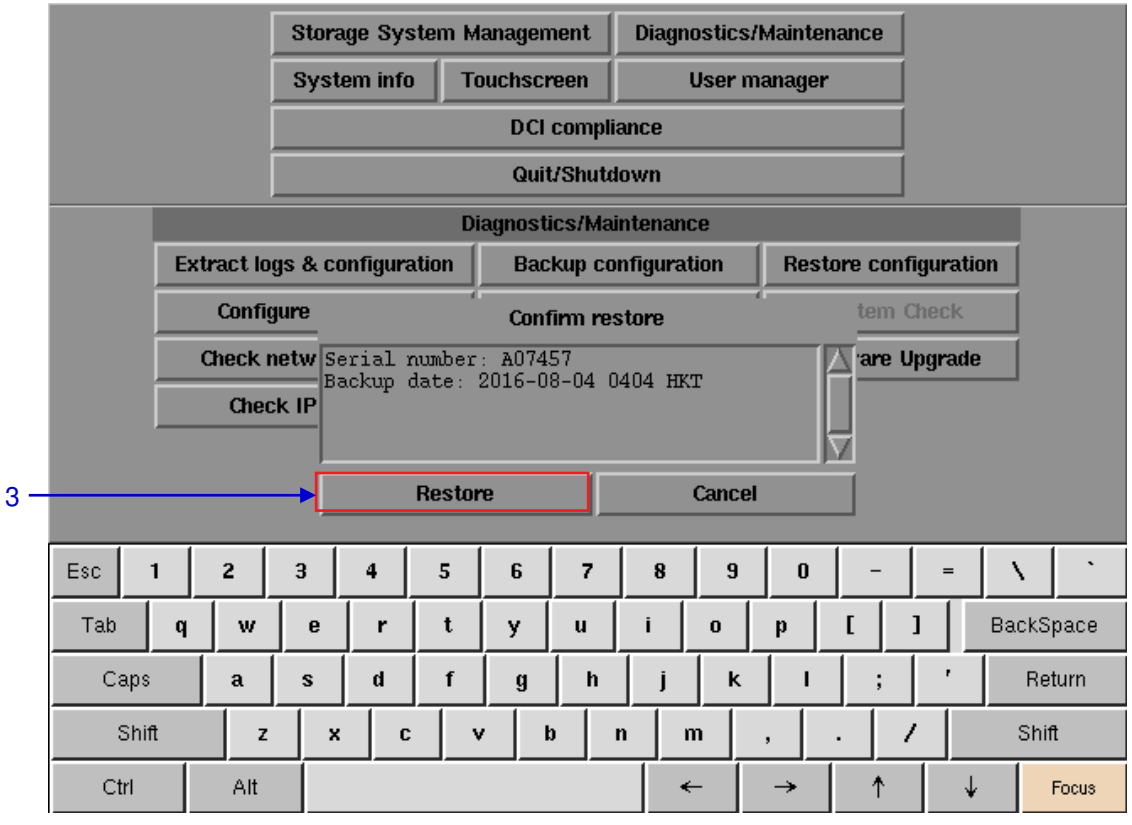
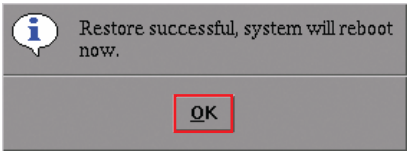


Figure 104 Confirm restore.

3	Information on the backup file will be displayed. Press Restore to confirm and restore configuration from the backup file.
4	When the configuration is restored from the backup file, a confirmation message will appear. Press OK. IMB will then be rebooted. 

5.3.2.5. Configure Timezone

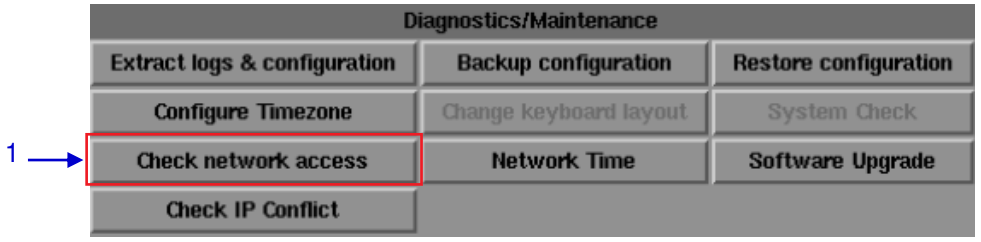


Figure 105 Diagnostics/Maintenance [Configure Timezone].

1	Select Configure Timezone. A new window will appear as seen in **Figure 106.**
2	Move the highlight bar to your geographical area by clicking the up [↑] or down [↓] arrow keys on the on-screen keyboard and then click the space key. Then click the right [→] arrow key to select the OK button.

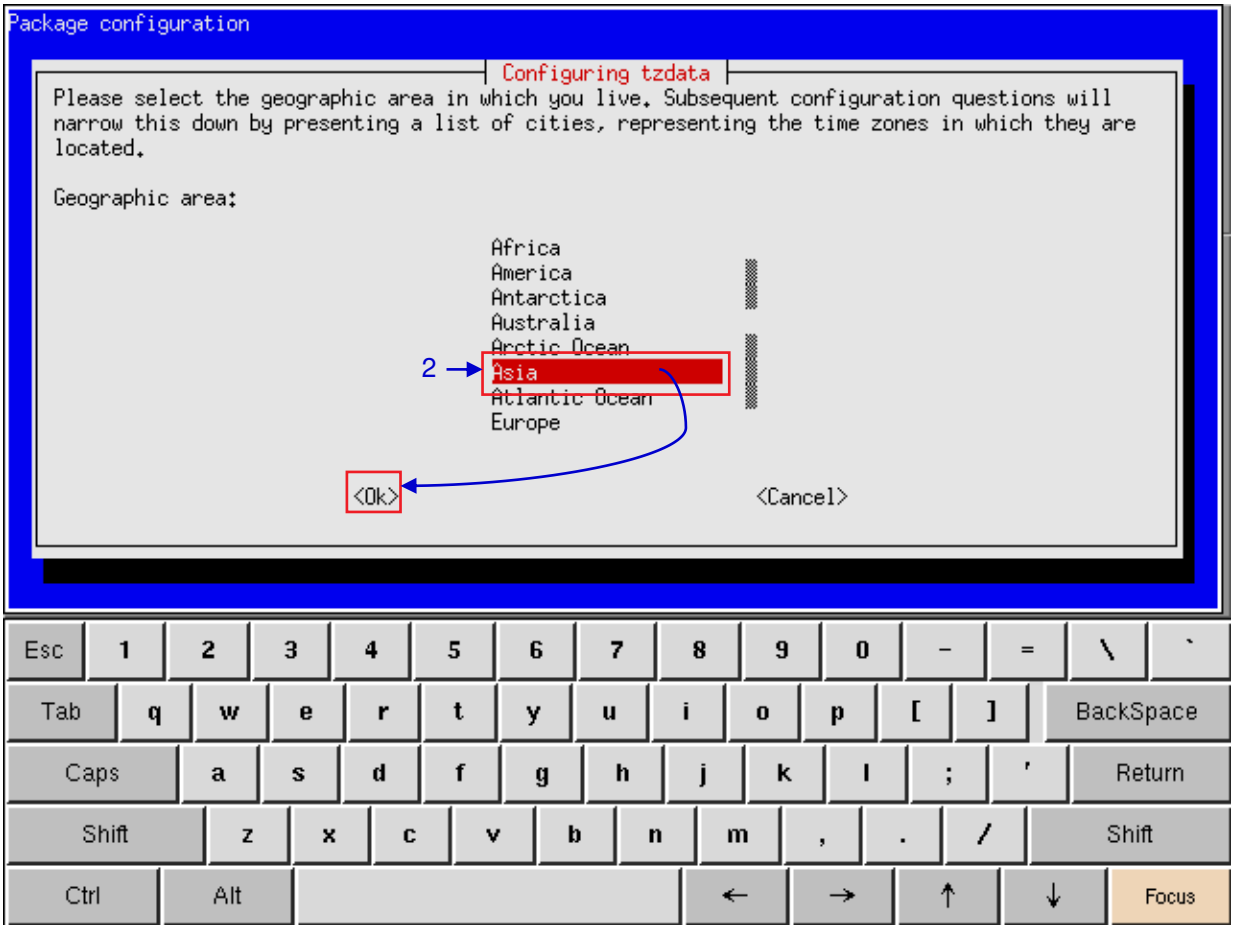


Figure 106 Selecting the timezone of specific region.

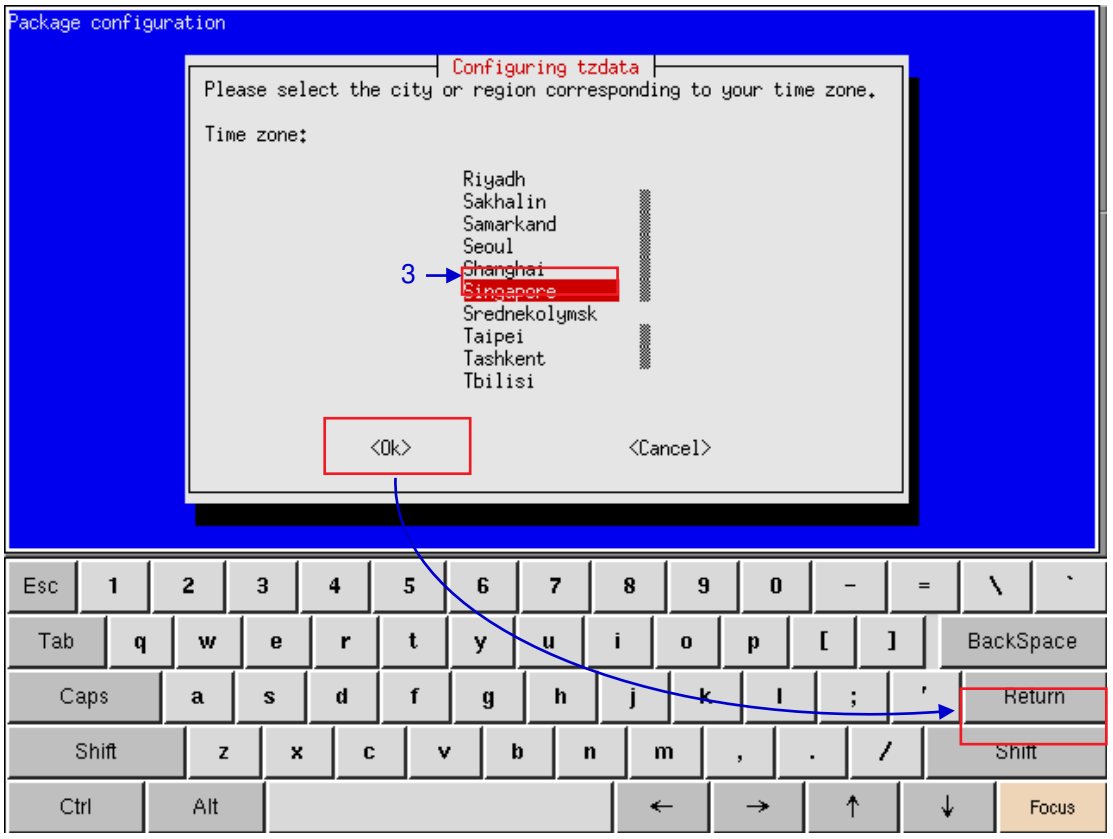


Figure 107 Selecting the timezone of specific country.

3	Move the highlight bar to your timezone by clicking the up [↑] or down [↓] arrow keys on the on-screen keyboard and then click the space key. Then click the right [→] arrow key to select the OK button and click Return.

5.3.2.6. Check Network Access

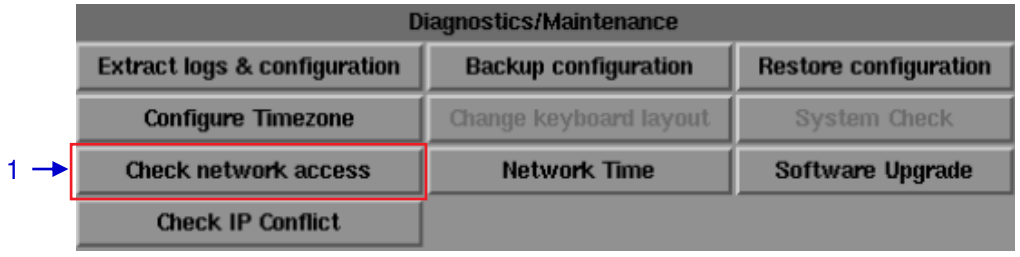


Figure 108 Network [Check network access].

1	Select Check network access on the Network.
2	A new window appears to enter Network or IP address. Enter the Network or IP address, and then select Test connectivity.

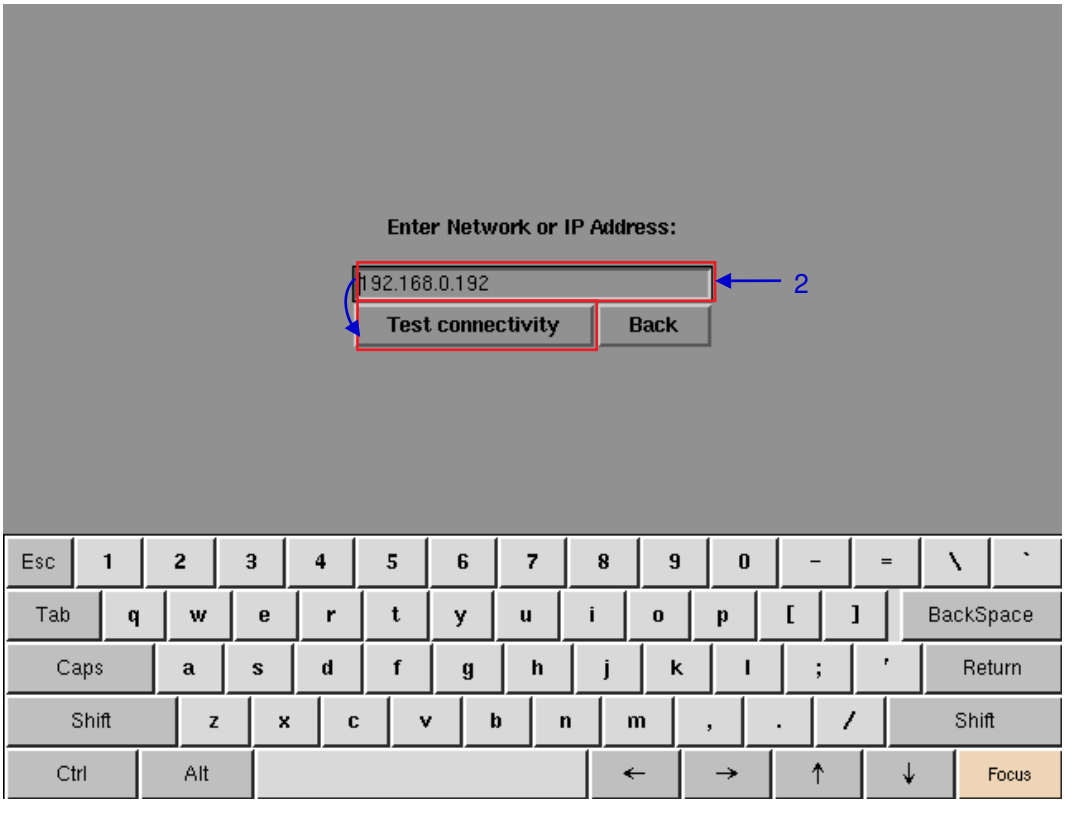


Figure 109 Entering the IP address of the IMB.

3	A new window will appear as seen in **Figure 110** showing a list of information after testing the connectivity.

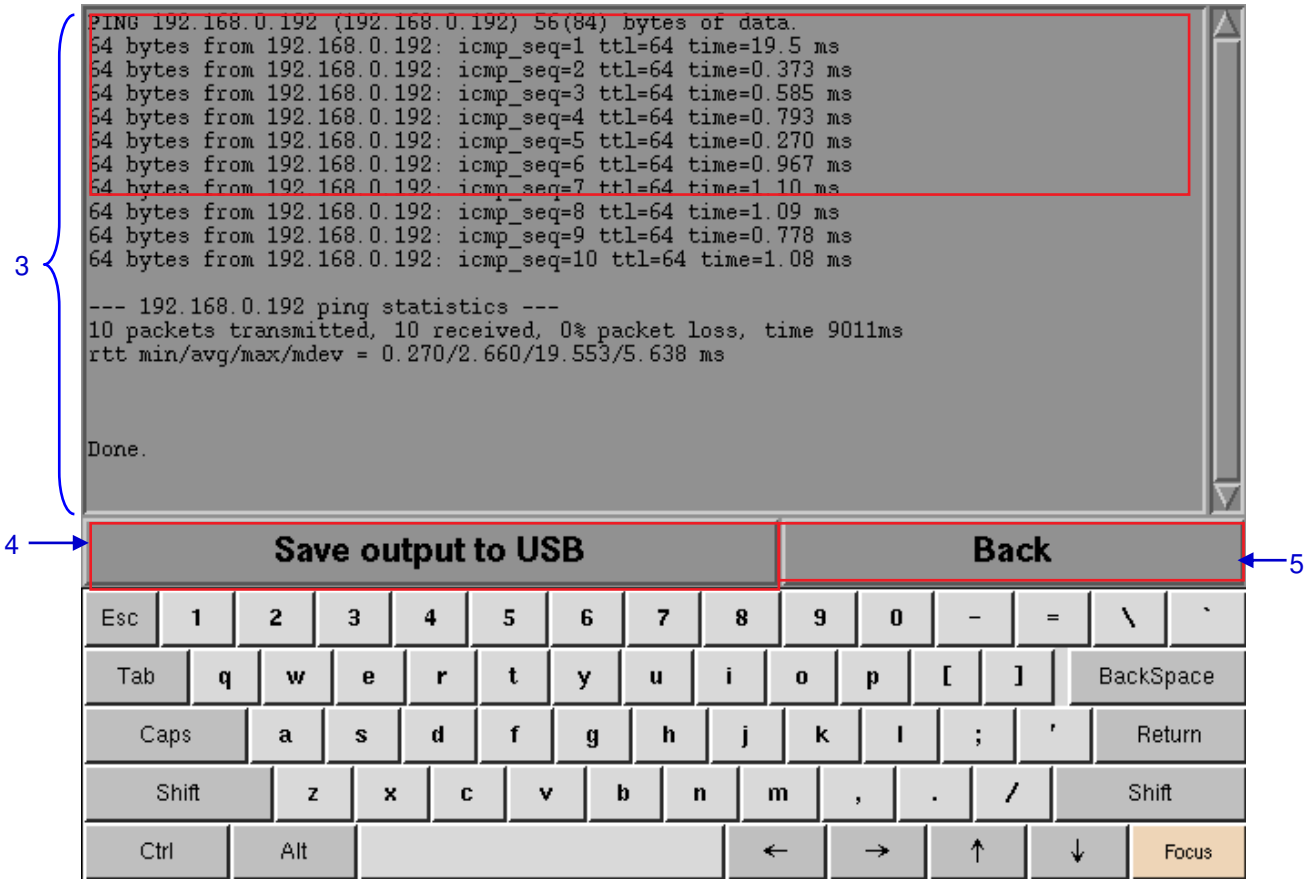


Figure 110 A list of information after testing the connectivity of the IMB to the network.

4	Press Save output to USB to save a screen capture of the information to a USB disk.
5	Press Back.

5.3.2.7. Network Time

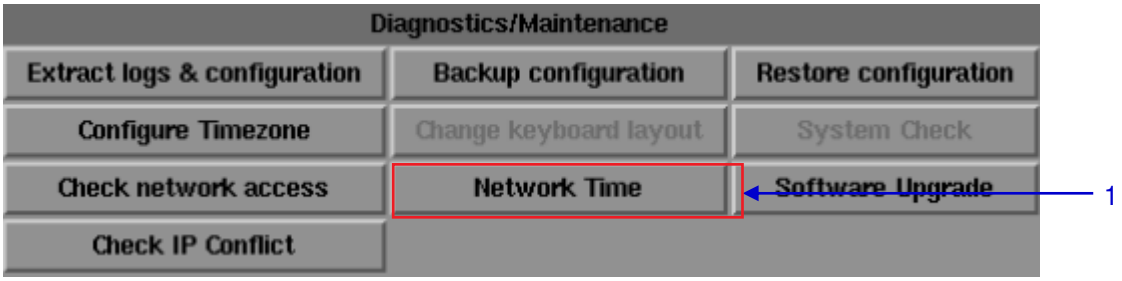


Figure 111 Network [Network Time].

1	Select Network Time on the Network.
2	A new window appears for NTP service configuration as shown in **Figure 112.** Select Enable NTP service. Type in the specified time server's IP address and press OK to start using the NTP server.

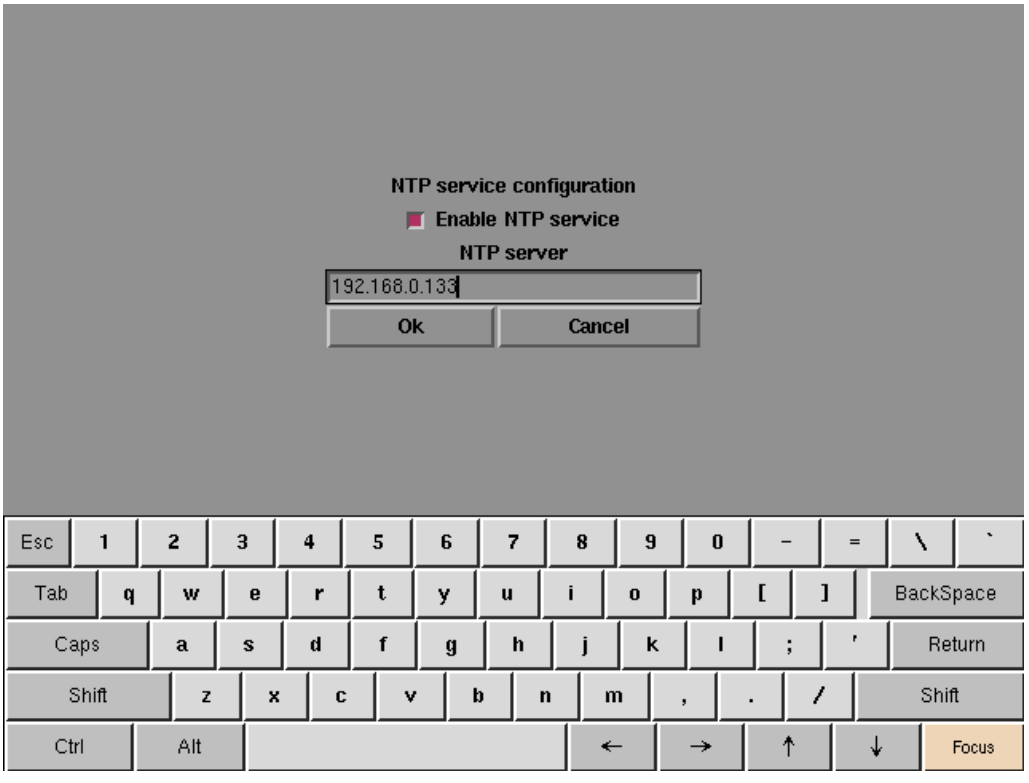


Figure 112 Entering the IP address of the time server.

5.3.2.8. Software Upgrade

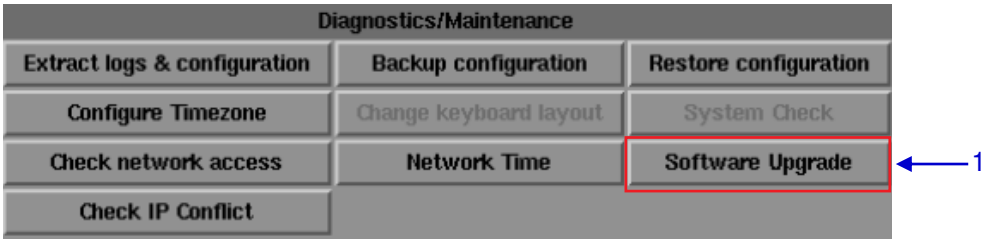


Figure 113 Diagnostics/Maintenance [Software Upgrade]

1	From the Software Upgrade button in the Admin Panel you can run any GDC issued upgrade files, once you press the button you will be prompted for the upgrade password as seen in **Figure 114.**

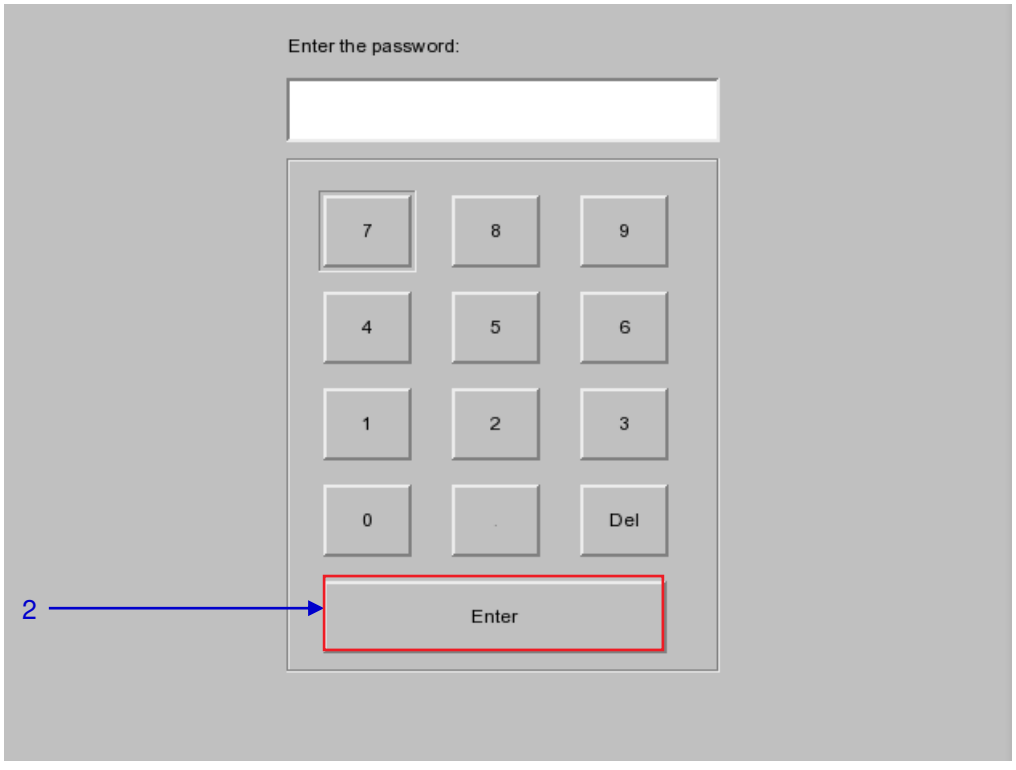


Figure 114 Diagnostics/Maintenance [Software Upgrade]

2	Enter the password of the upgrade file and press Enter.

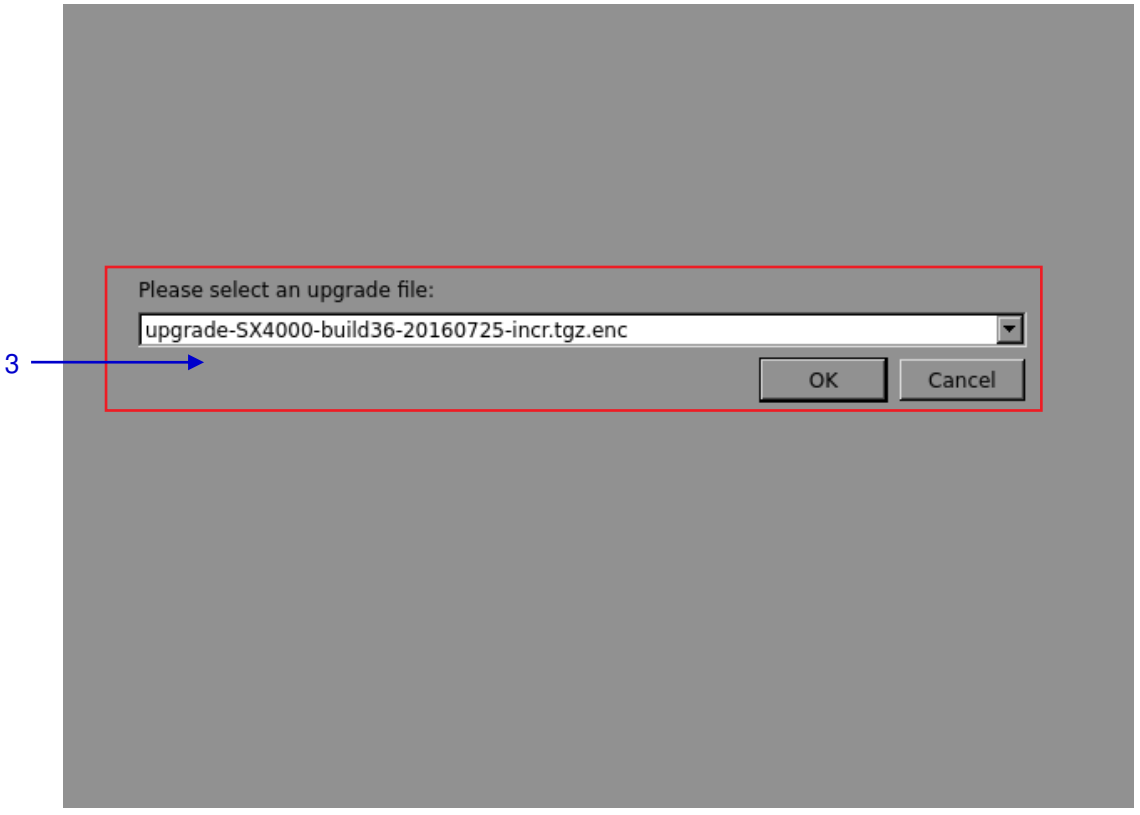


Figure 115 Diagnostics/Maintenance [Software Upgrade]

3	Select the upgrade file from the dropdown list and press OK.

5.3.2.9. Check IP Conflict

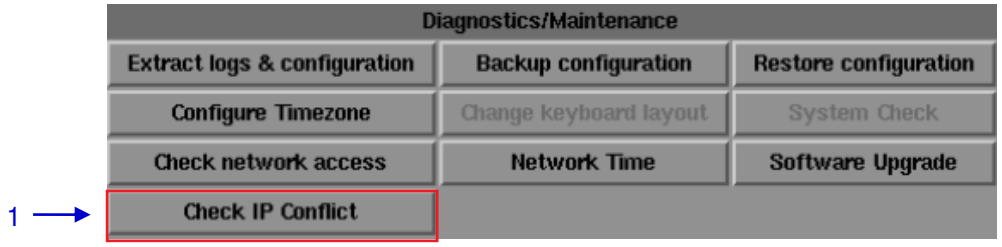


Figure 116 Diagnostics/Maintenance [Check IP Conflict]

1	Select Check IP Conflict on the Network. A new window will appear as shown in **Figure 117**.

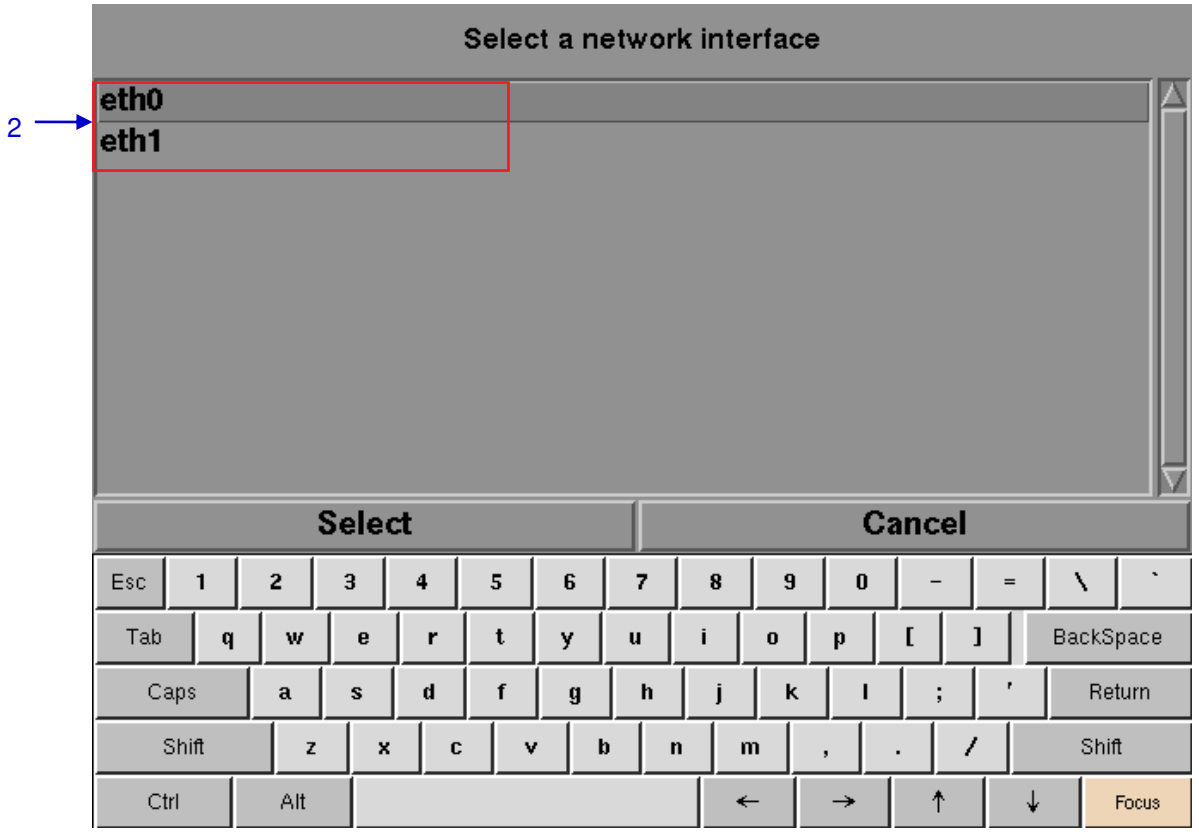


Figure 117 Network interface Selection

2	Select a network interface for checking IP conflict.

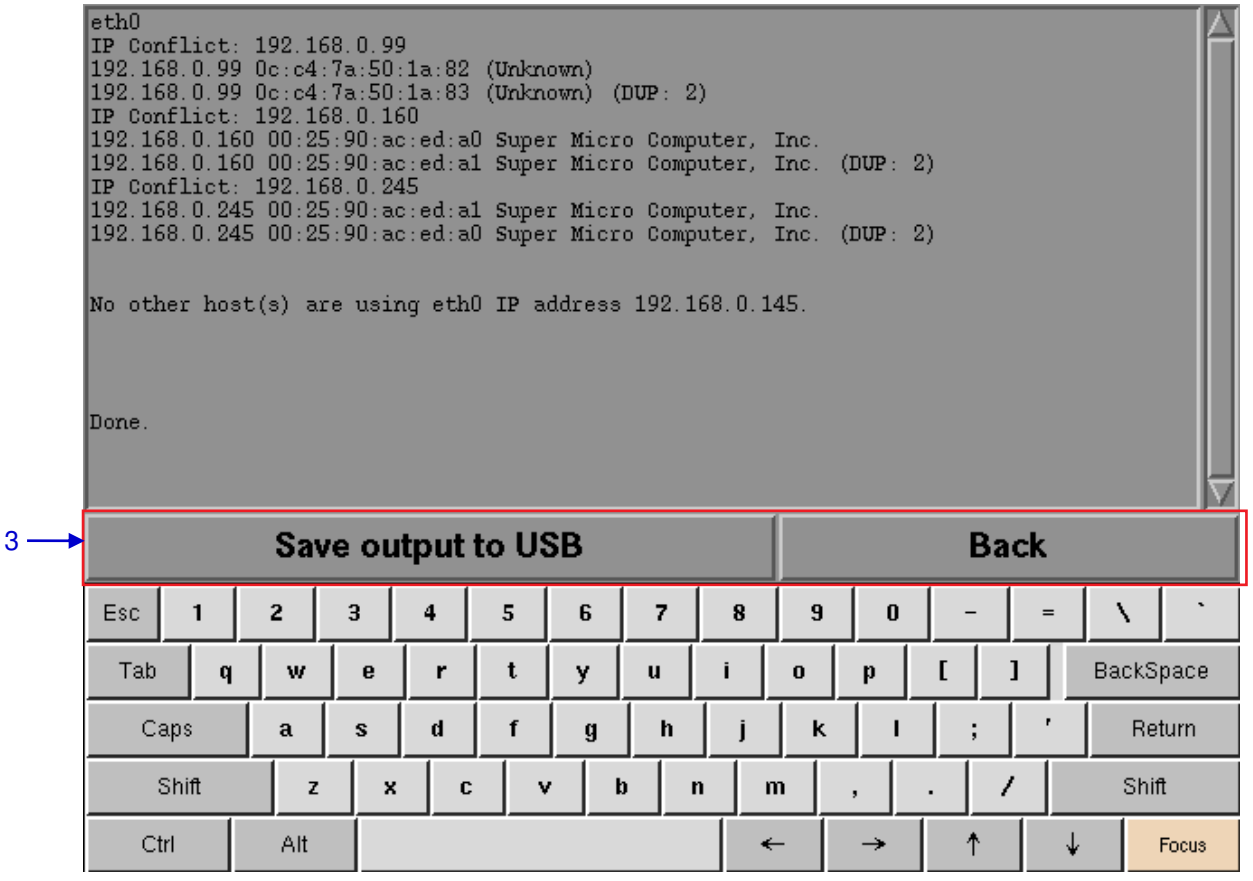


Figure 118 IP conflict Result

3	Select Save output to USB to save a screenshot of the information to a USB disk. Click Back to exit.

5.3.3. System Information

5.3.3.1. Access to System Info

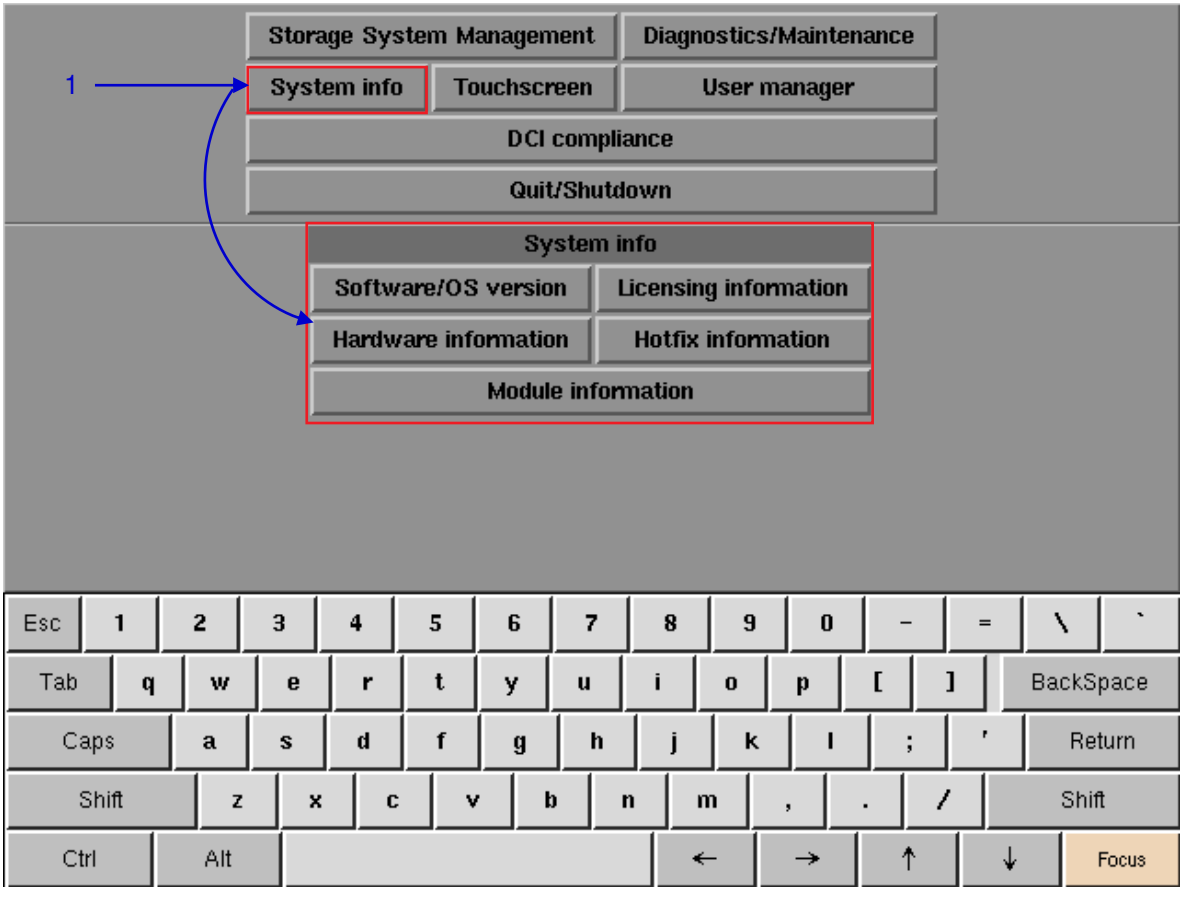


Figure 119 System Info

1	On the Main menu, select System Info. A small window for System info appears.

5.3.3.2. Software/OS Version

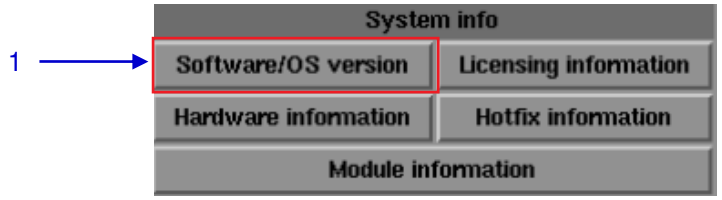


Figure 120 System Info [Software/OS version].

1	Select Software/OS version on System Info.
2	The OS and Software versions of the IMB are shown in a new window as seen in **Figure 121**. Press Back to return to System Info.

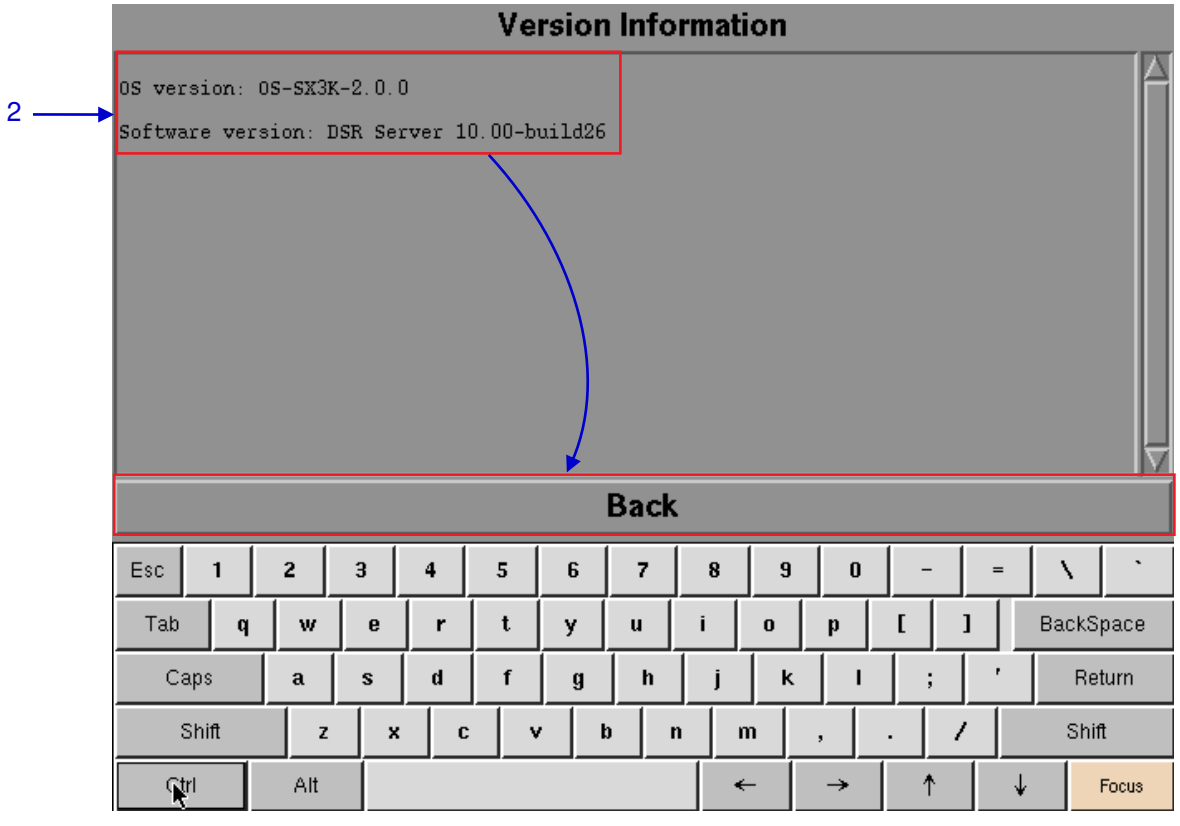


Figure 121 Shows current software and OS versions of the IMB.

5.3.3.3. Hardware Information

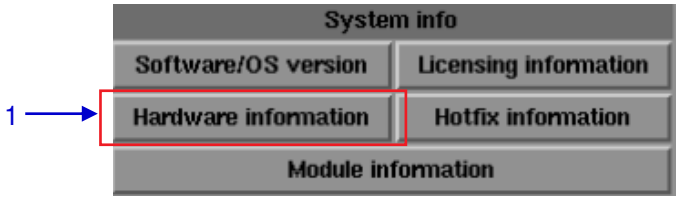


Figure 122 System Info [Hardware information].

1	Select Hardware information on the System Info.
2	A new window showing the list of hardware information including the Motherboard, Video card and JPEG2000 card used in the IMB as seen in **Figure 123**. Press Back to exit and return to System Info.

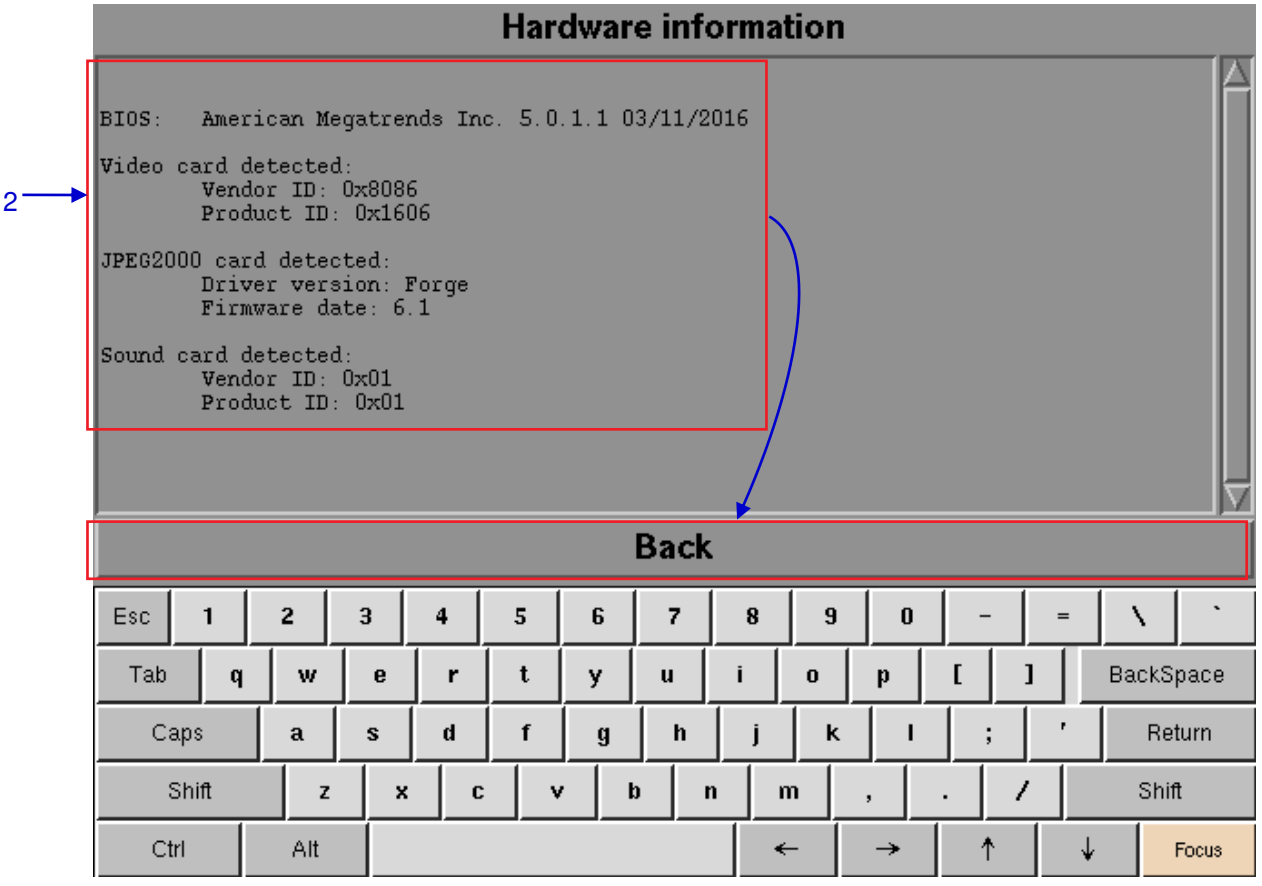


Figure 123 List of hardware information including the Motherboard, Video card and JPEG2000 card used in the IMB

5.3.3.4. Licensing Information

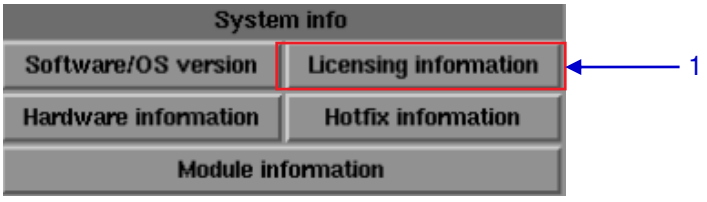


Figure 124 System Info [Licensing information].

1	Select Licensing information on System Info.
2	A new window shows the serial number and license capabilities of available options in the server as seen in **Figure 125**. Press Back to return to System Info.

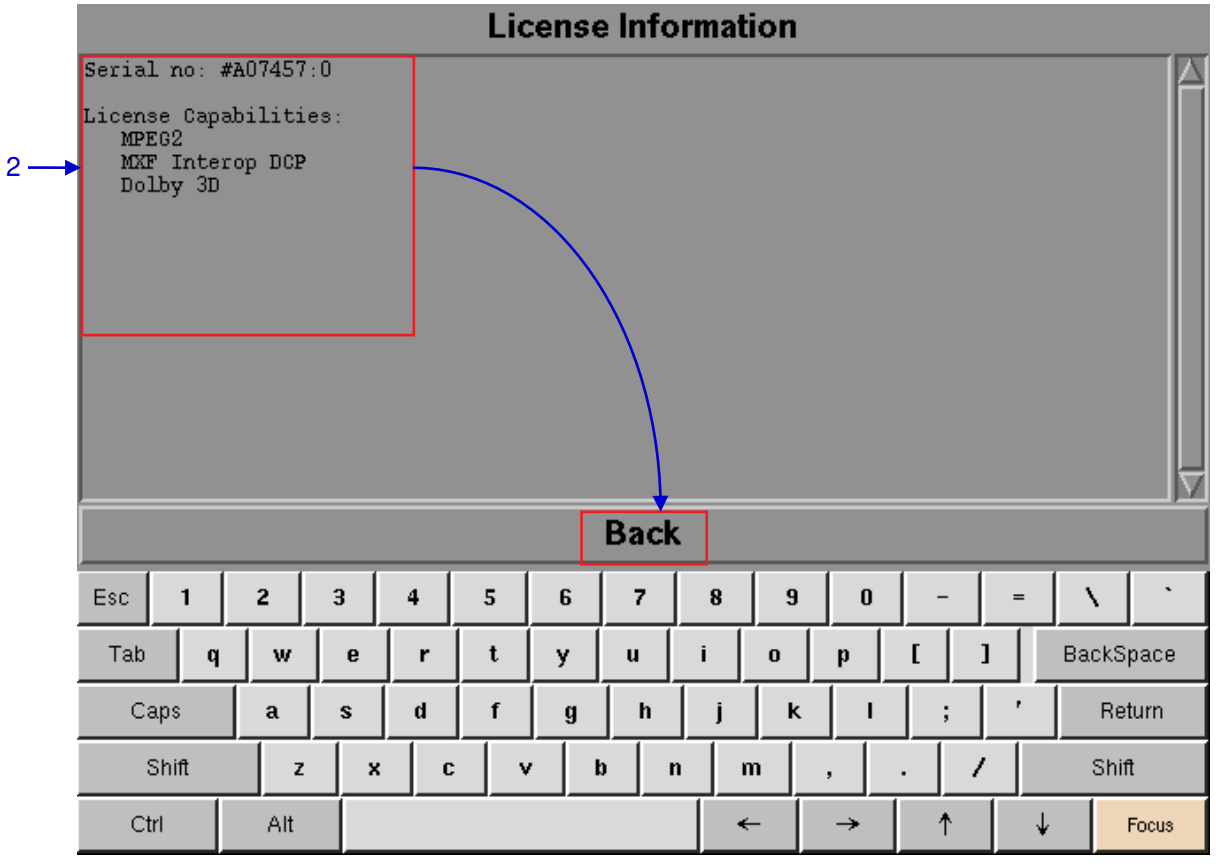


Figure 125 The serial number and license capabilities of available options in the server.

5.3.3.5 Hotfix Information

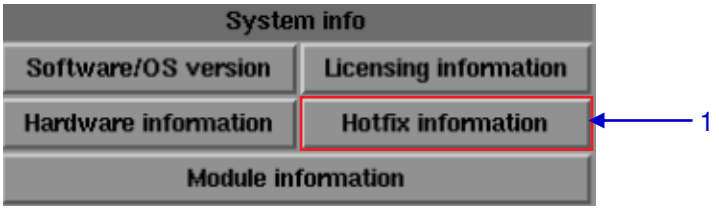


Figure 126 System Info [Hotfix information].

1	Select Hotfix information. It allows the user to check on the patches and upgrades installed on the IMB.
2	A new window showing hotfix information appears as seen in **Figure 127**. Press Back to return to the System Info.

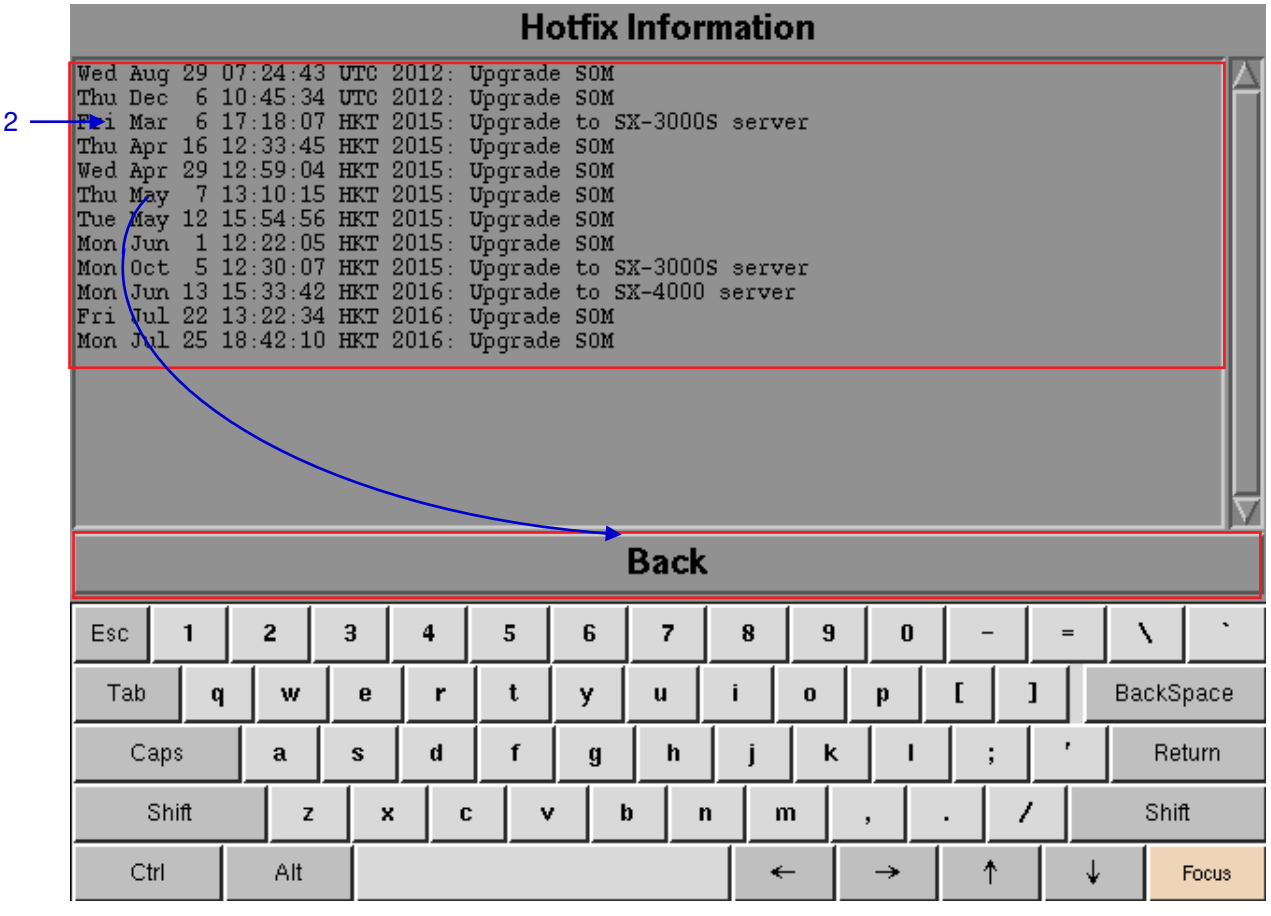


Figure 127 Patches and upgrades installed in the IMB.

5.3.3.6 Module Information

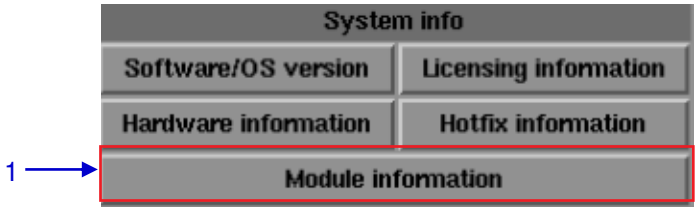


Figure 128 System info [Module information]

1	The Module information button provides the user with detailed version information used in troubleshooting.
2	A new window showing module version information appears as seen in **Figure 129.** Press Back to return to the System Info.

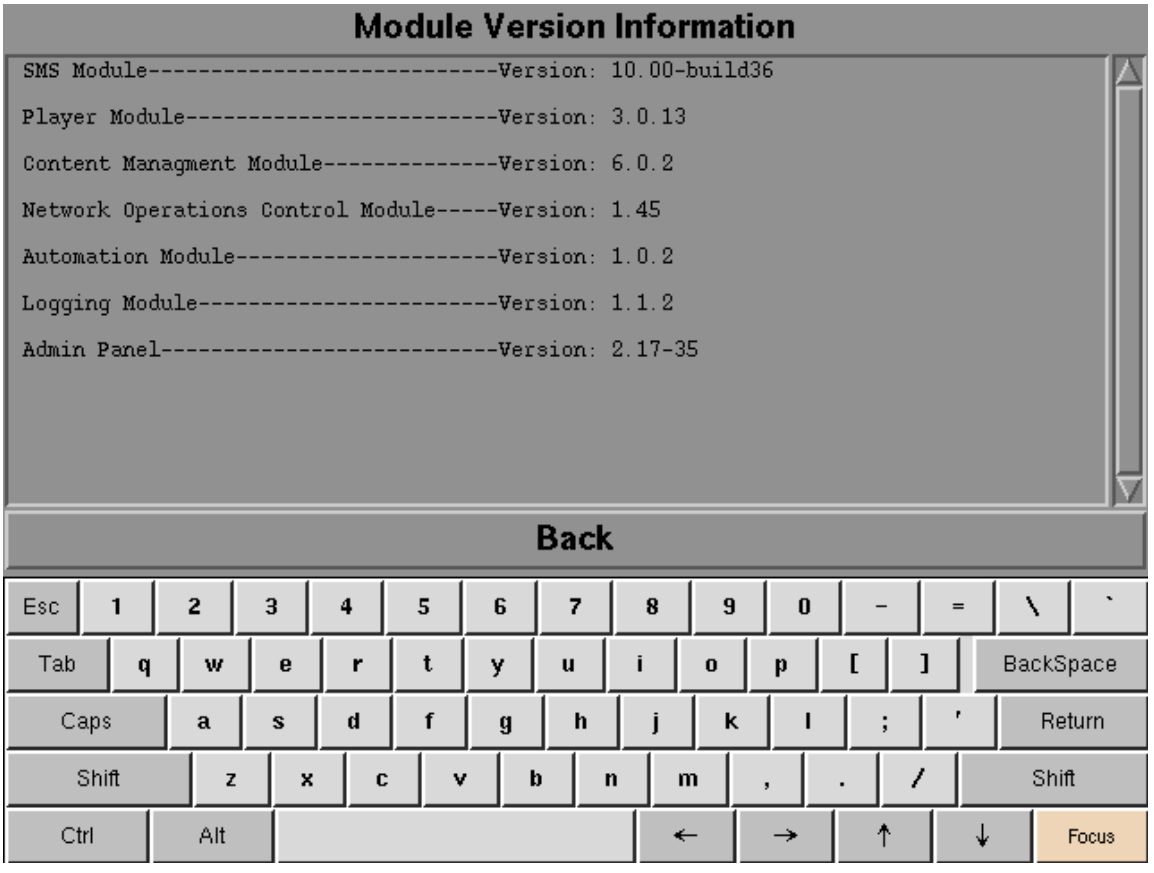


Figure 129 Module Version Information

5.3.4. Touchscreen

5.3.4.1. Access to Touchscreen

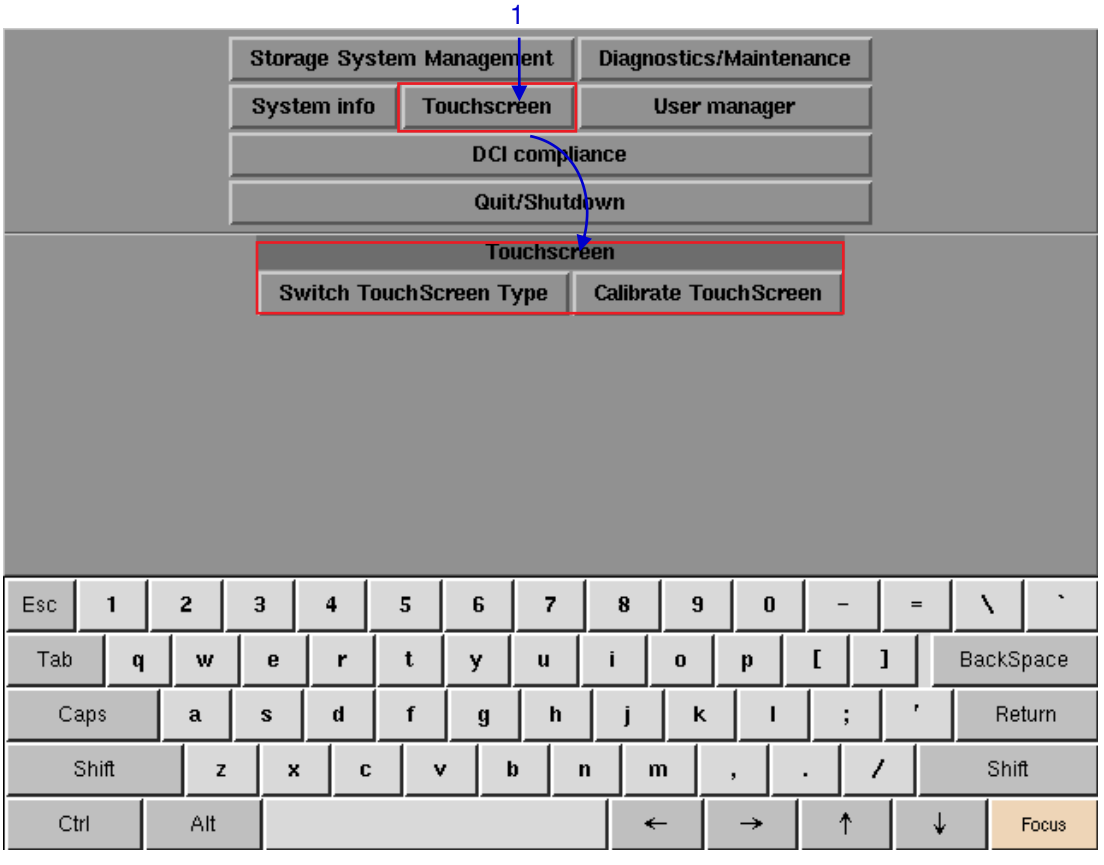


Figure 130 Touchscreen

1	On the Main menu, select Touchscreen. Touchscreen appears showing two types of touchscreens.

5.3.4.2. Select Touchscreen Type

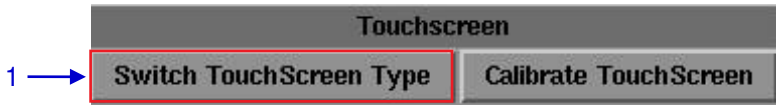
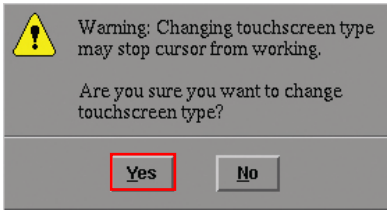
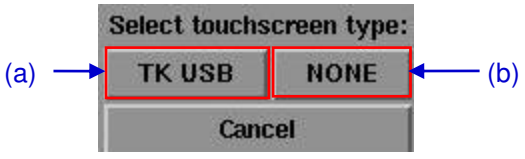
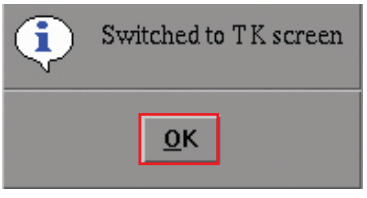
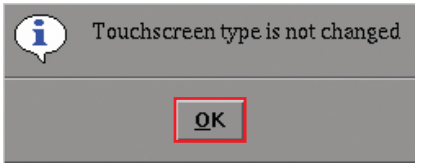


Figure 131 Touchscreen [Switch Touchscreen Type].

1	Select Switch Touchscreen Type. A small dialog box pops up warning that the cursor may stop working if a change is made to the touchscreen type.  Select Yes to confirm the change in touchscreen type.
2	A small menu for selecting the touchscreen type appears.  (a) If TK USB is selected, the screen will switch to TK screen in USB connection with the system. Press OK to confirm.  (b) If NONE is selected, touchscreen functionality will be disabled. Press OK to confirm.

	A small window indicating no change in touchscreen type will appear if the selected screen type is already activated. 

5.3.4.3. Calibrate Touchscreen

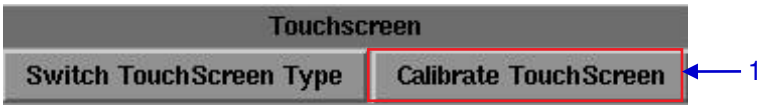


Figure 132 Touchscreen [Calibrate Touchscreen].

1	Select Calibrate Touchscreen.
2	If Calibrate Touchscreen is selected when in TK USB screen, the screen will appear as seen in **Figure 133**.

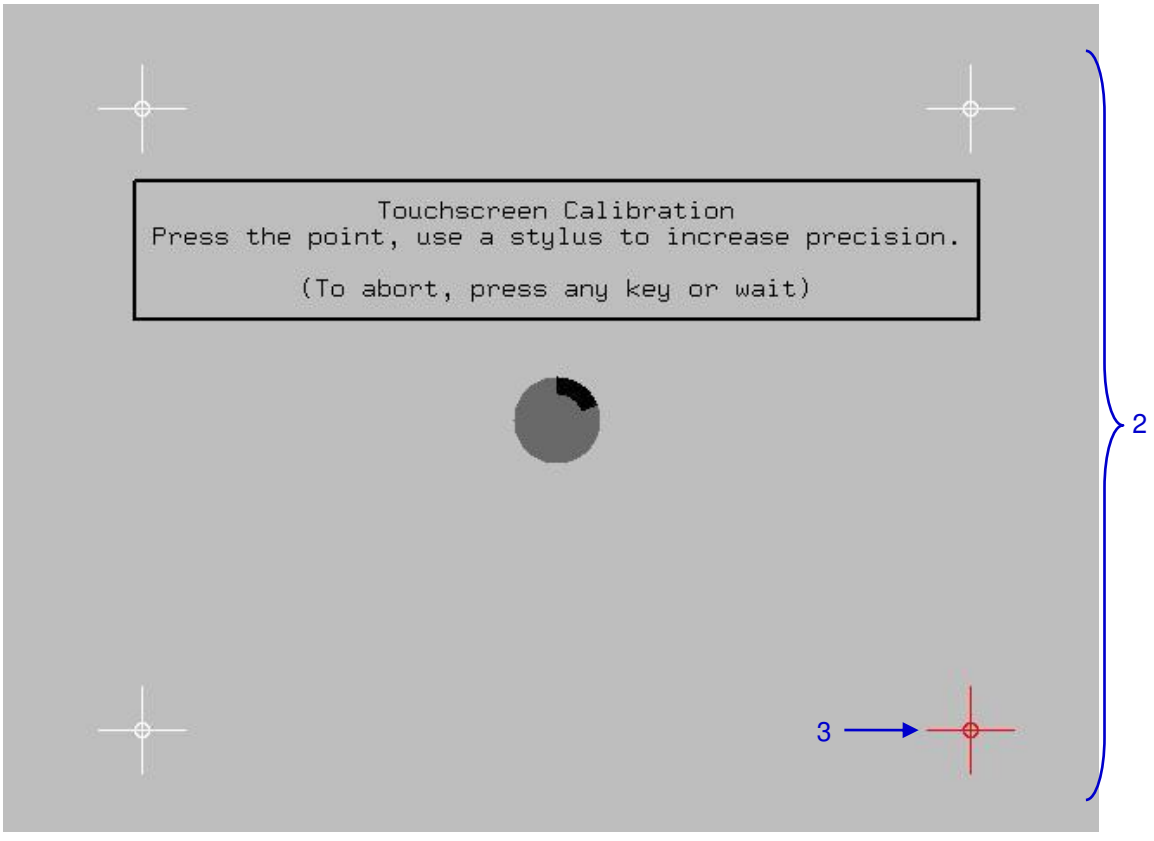


Figure 133 Calibrating the touchscreen by 4-pt calibration method.

3	Touch the blinking symbol until it stops. Continue touching the blinking symbols on each of the four (4) corners of the screen to complete the calibration of the touchscreen.

5.4. User Manager

5.4.1. Access to User Manager

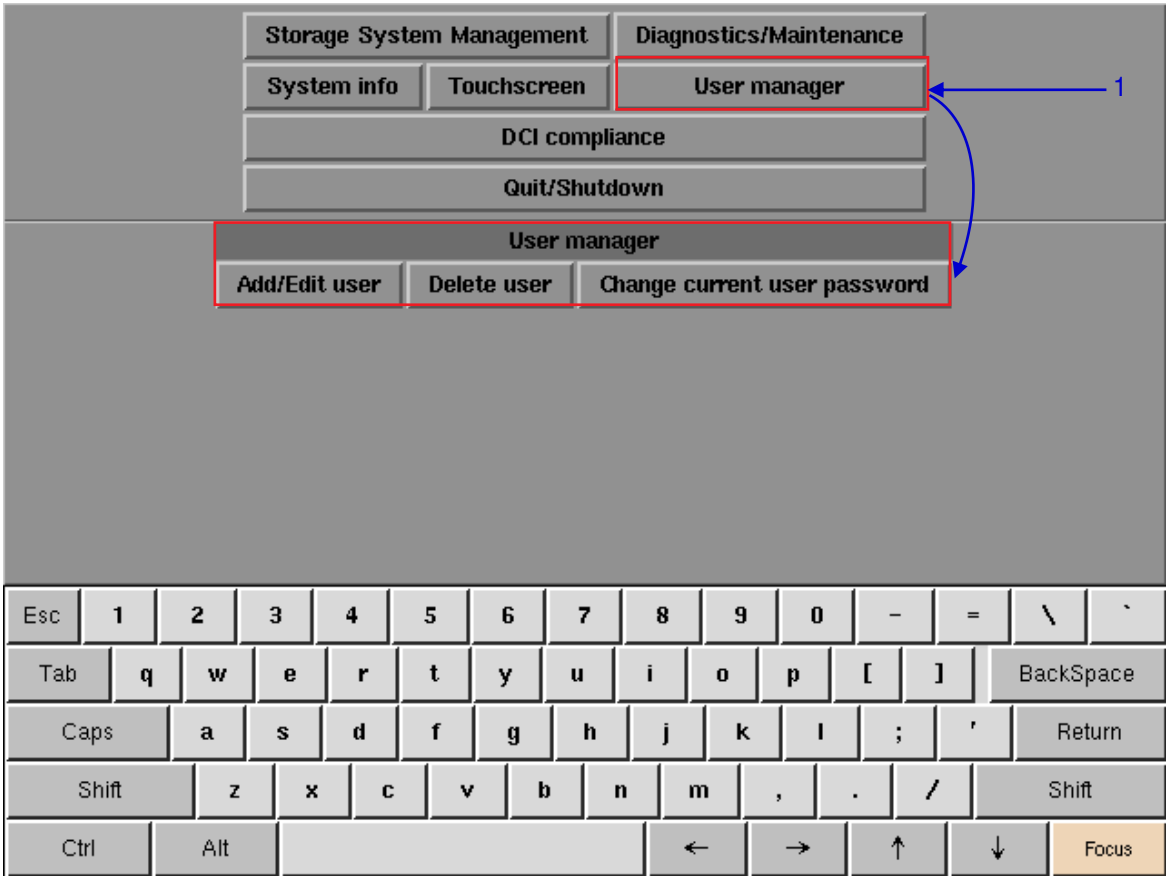


Figure 134 User Manager

1	On the Main menu, select User Manager. A small window for User Manager appears.

5.4.2. Add/Edit user

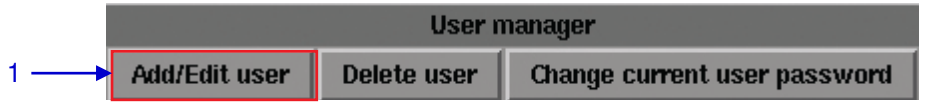


Figure 135 User manager [Add/Edit user].

1	On the Main menu, select Add/Edit user. A new window for username and password entries will appear as shown in **Figure 136.**

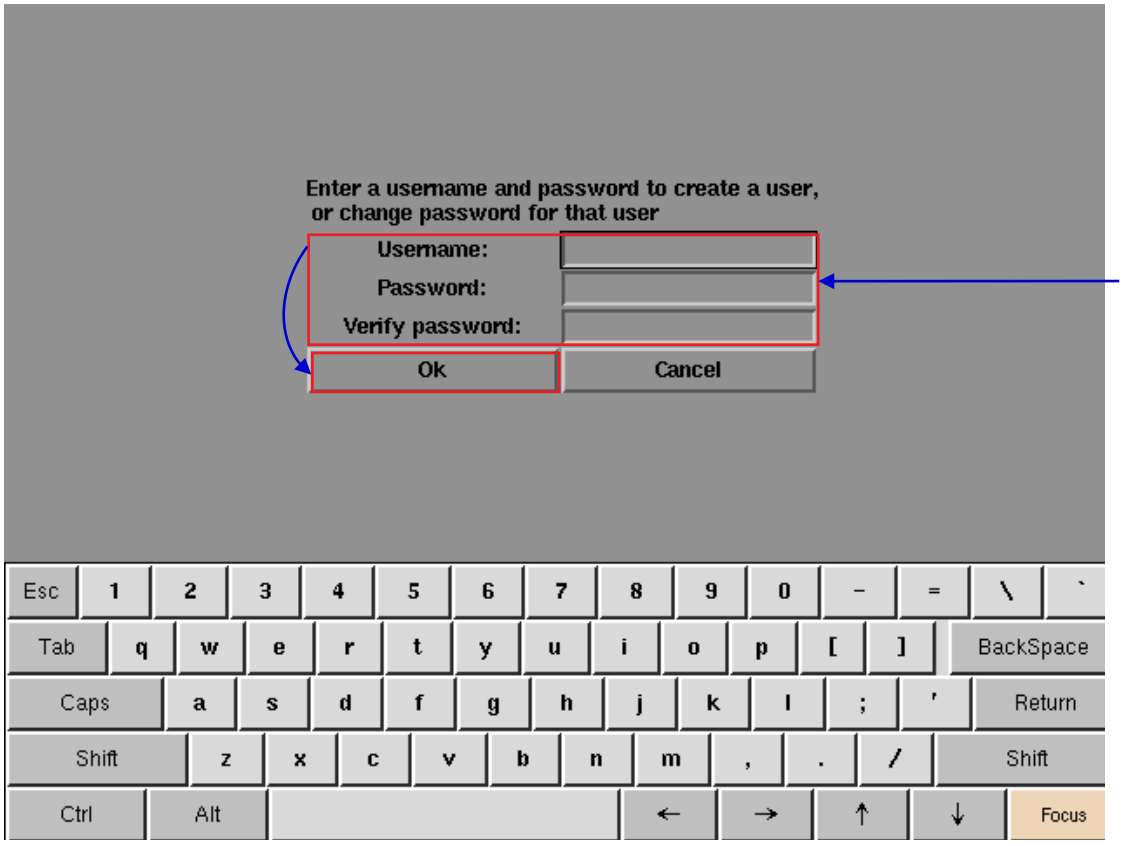
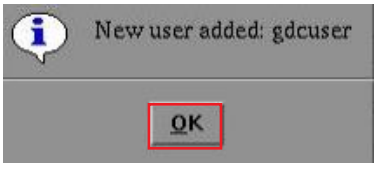
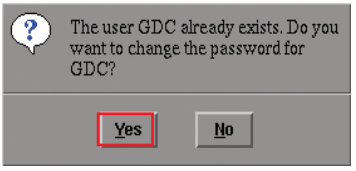


Figure 136 Username and Password entries.

2	Type in your desired Username and Password using the on-screen keyboard to create a new username and password, and press OK.
3	A small window will appear after creating your username and password.  Press OK to confirm and exit.

4	To edit the password, enter your current username and type in your new password. A small window pops up asking if you want to change the password. Press Yes to confirm.  A new window appears to confirm the password has changed. Press OK to exit and return to User Manager.

5.4.3 Delete User

Figure 137 User manager [Delete user].

1	Select Delete user. A new window appears showing a list of usernames as seen in **Figure 138**.

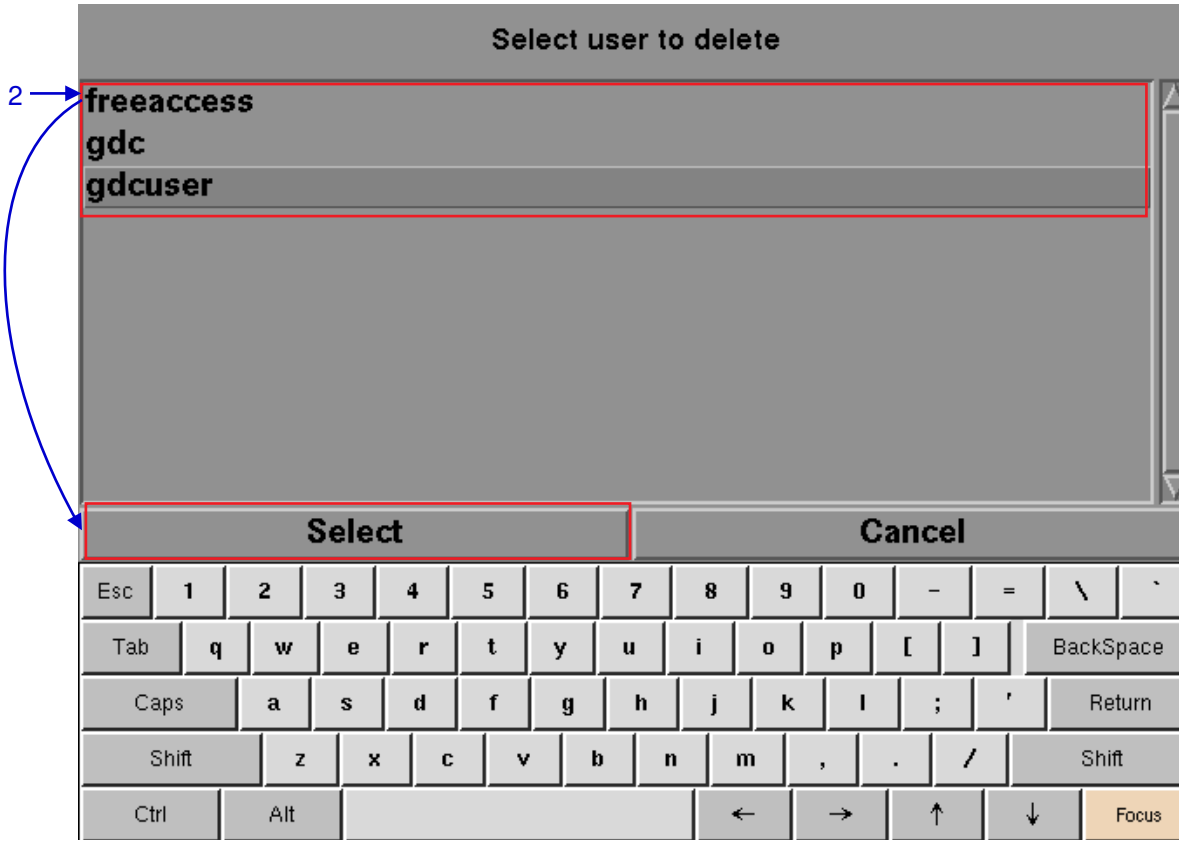
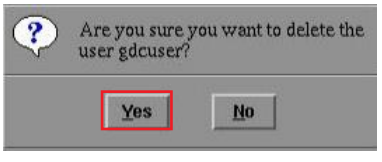
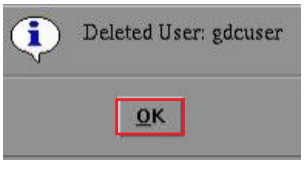


Figure 138 Selecting the username to be deleted.

2	Select the username you want to delete and press Select. A small window pops up to confirm if you want to continue to delete the user. Select Yes to confirm. A small window appears confirming the user has been deleted.  Press OK to exit and return to User Manager. 

5.4.4. Change Current User Password

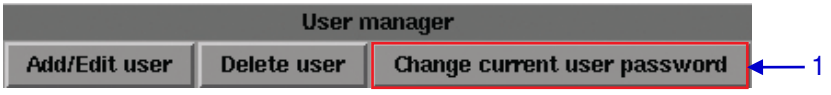


Figure 139 User manager [Change current user password].

1	Select Change current user password. A new window for password entry appears as seen in **Figure 140**.

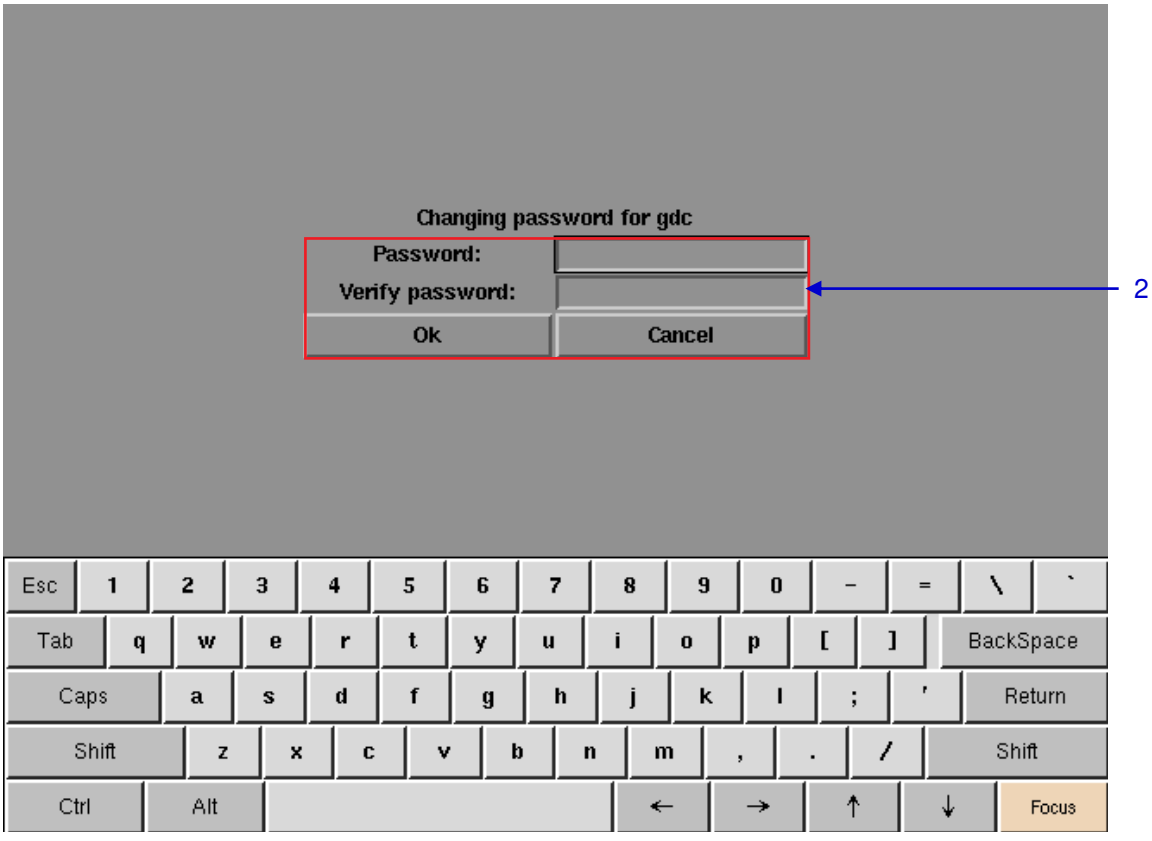
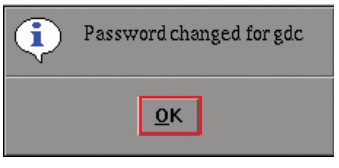


Figure 140 Password entry to change password.

1	Type in your new password and press OK. A small window appears confirming the change in password.  Press OK to exit and return to User Manager.

5.5. DCI Compliance

5.5.1. Access to DCI Compliance

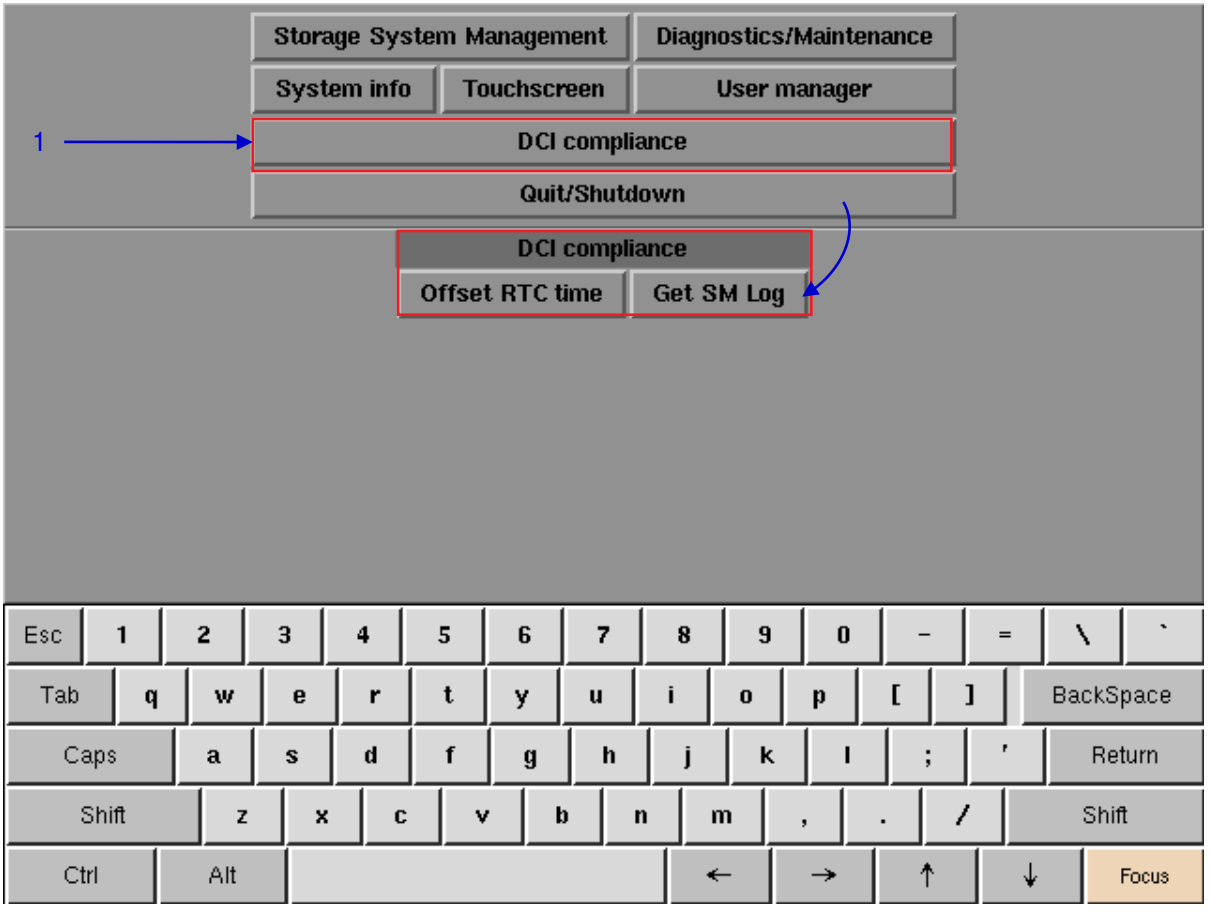


Figure 141 DCI compliance

1	Press the DCI compliance button to access the RTC time offset or extract the SM (Security Manager) logs.

5.5.2. Offset RTC Time

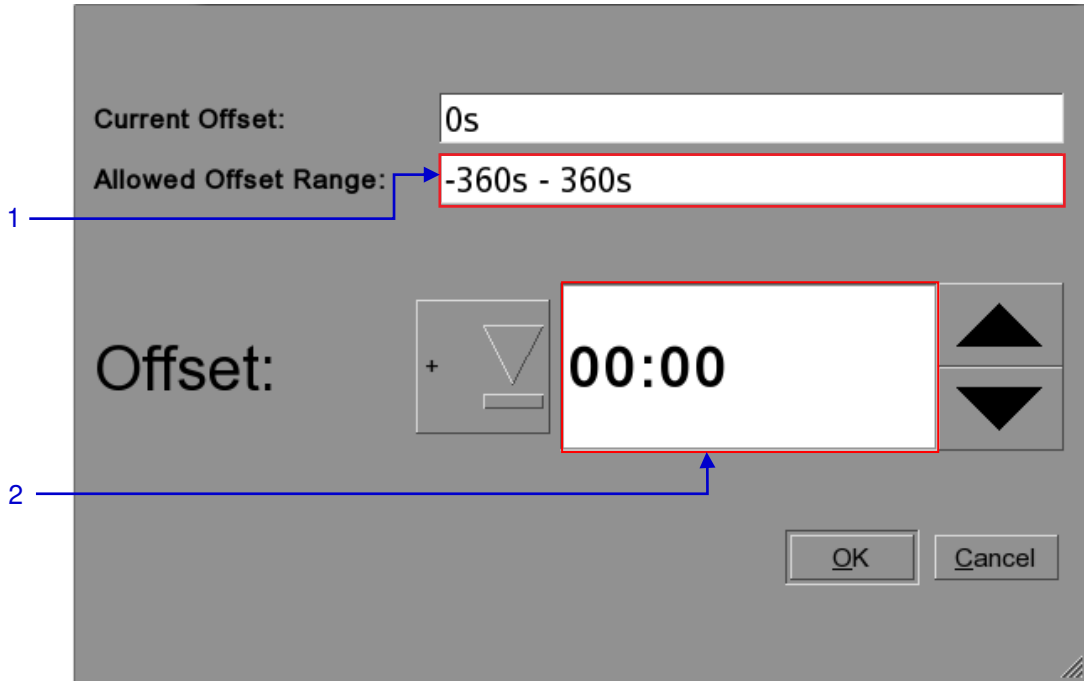


Figure 142 RTC Offset.

1	The allowed offset range is set to plus or minus 360 seconds
2	The Offset can be set + or – within the allowed offset range seen in field 1. The time is set in MM:SS (Minutes: Seconds)

5.5.3. Get SM Log

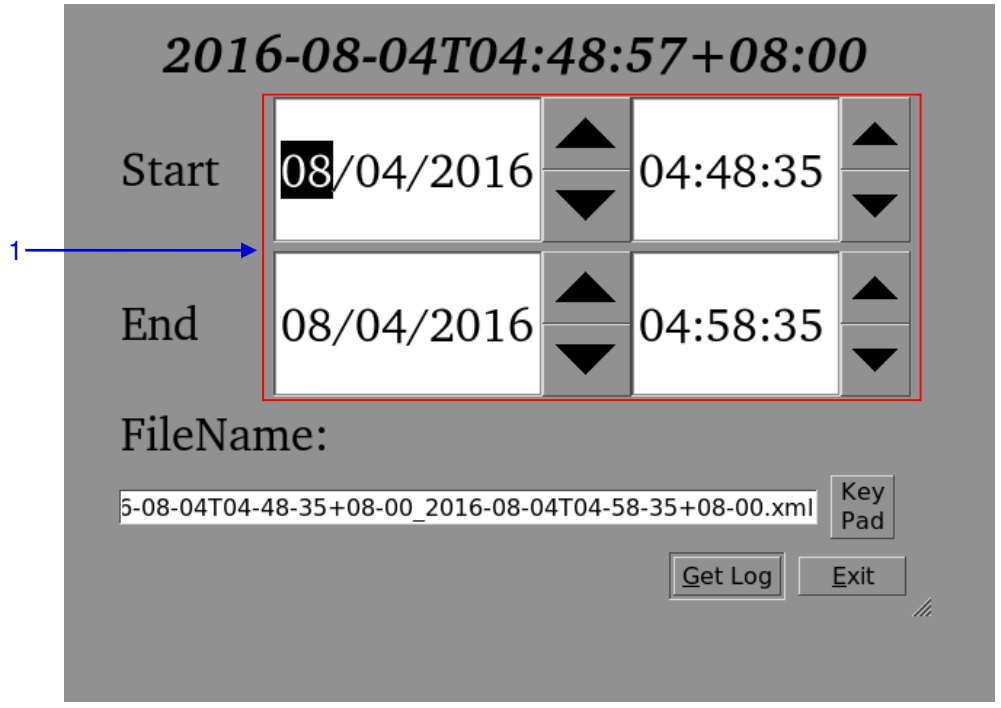


Figure 143 Set time for SM log.

1	Choose the date and time range for SM log extraction. It is possible to alter the name of the output file with the Key Pad button. Once a USB drive has been inserted press the Get Log button.

5.6. Quit/Shutdown

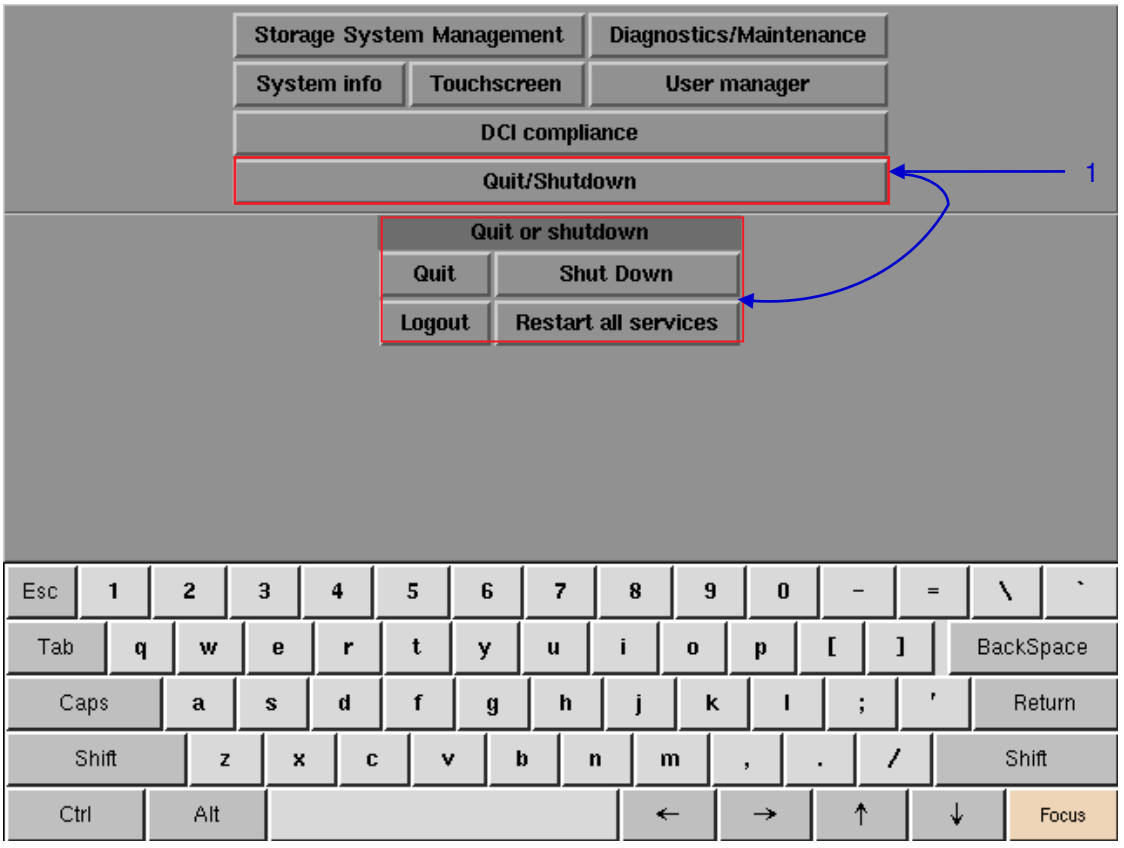
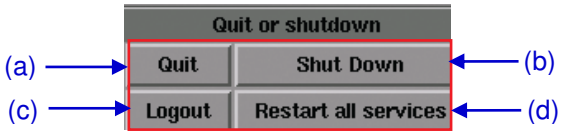
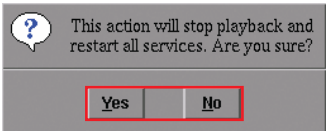


Figure 144 Quit/Shutdown

1	On Main menu, select Quit/ Shutdown. A small window shows the Quit/Shutdown.  (a) Select Quit to switch to the Control Panel. (b) Select Shut Down to turn off the IMB. (c) Select Logout to logout the current user and return to the Admin Panel startup window.

(d) Select Restart all services to restart all automation, communications, playback, and content management services on the IMB. Playback will be stopped while services are restarted.

Select Yes to restart services or No to cancel.



A confirmation message will be displayed after all services are restarted. Press OK to exit.

6. OPERATION NOTES

6.1. Power Up Sequence

Always power up any external storage before powering up the projector. The external storage must be powered up first to be correctly identified by the SX-4000.

6.2. Power Down Sequence

Always power down the SX-4000 and projector with the following steps:

1. Power down the SX-4000 by using the SMS → Shutdown button.
2. Power down the projector after the SX-4000 is powered down.
3. Power down any external storage attached to the SX-4000.

7. APPENDIX

This section describes optional features on the SX-4000 that require licenses from GDC.

7.1. Network Streaming

The SX-4000 is capable of playing live network streams. This section provides information on configuring the SX-4000 for live network streaming.

7.1.1. System Configuration

Use the ‘Streaming’ tab on the SMS configuration interface to set network streaming parameters.

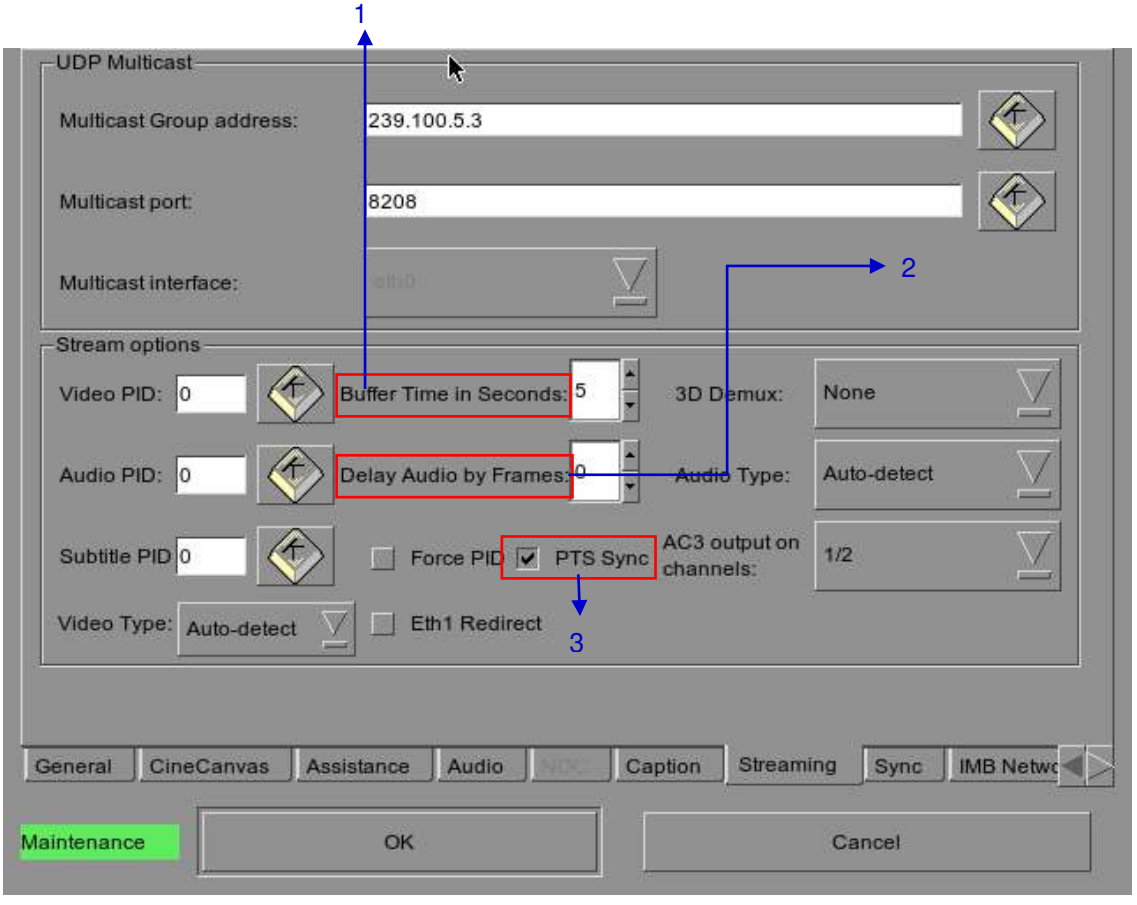


Figure 145 Streaming Tab.

1	This configuration option allows video and audio to be buffered for a fixed amount of time before playback. (Recommended value: 5 seconds). Increasing this value is only needed on unstable connections.
2	This configuration option allows audio to be delayed, for cases where source audio and video are out of sync. Both positive and negative audio and video playback. (Recommended value: 0 frames).
3	Setting the 'PTS sync' option will force playback to use the Presentation TimeStamp (PTS) header in the IP Stream to synchronize audio and video playback. (Recommended: unchecked) ***Note***: Using this option will use a new mechanism to sync audio and video playback. 'Unchecked' is the same method as used in prior software versions and is recommended. Check this option only if default unchecked method fails to achieve proper audio and video sync

7.1.2. Network Streaming Configuration

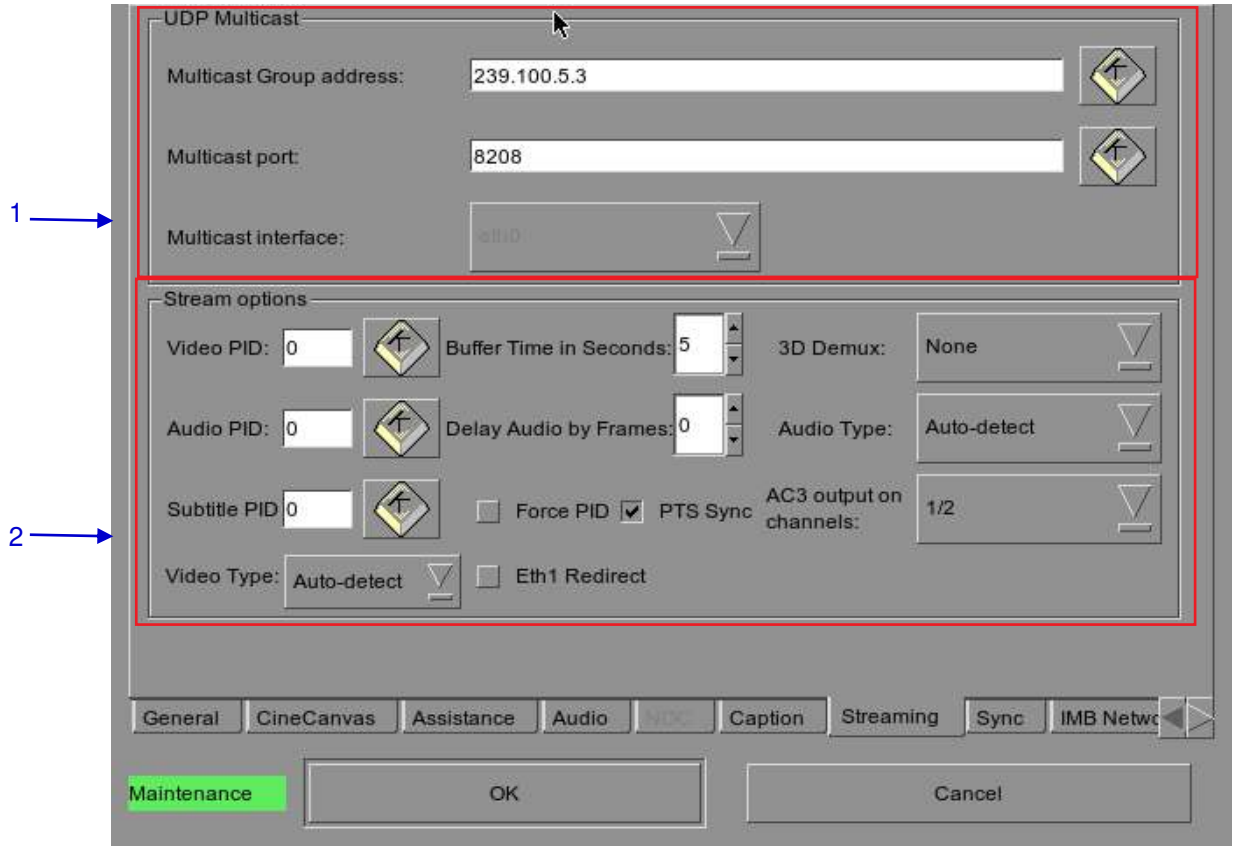


Figure 146 Streaming Tab.

1	[UDP Multicast]	This section will configure the network stream parameters
	[Multicast Group address]	IP Address of streaming source
	[Multicast port]	Port of the streaming source related to the IP address
2	[Video PID] [Audio PID] [Subtitle PID]	Video, Audio and Subtitle PID are usually provided by the broadcaster. If the video or audio PID is set to '0', the SX-4000 will automatically search and play back the last video or audio stream found in the network system. Check Force PID box to ensure the SX-4000 to use the provided PIDs. Note: having the values set to '0' will cause errors in receiving the network stream when the Force PID box is checked.
	[Video Type]	Choose between MPEG2 and H.264 (MPEG4) or Auto-Detect.
	[3D Demux]	Select whether to apply 3D demux to incoming video stream. None (2d): 2D video output; Side-by-side (3D): 3D video output with side-by-side 3D demux
	[Audio Type]	Audio Type can be automatically detected, or you may choose either AC3 or MPEG2, depending on the exact audio format delivered by streaming content
	[AC3 output on channels]	AC3 audio output from SX-4000 will pass-through as a digitally compressed audio system to an external audio processor. Select a pair of SX-4000 audio output channels to send this pass-through compressed audio system
	[PTS Sync]	Setting the "PTS sync" configuration option will force playback to use the Presentation TimeStamp (PTS) header in the IP stream to synchronize audio and video playback. (Recommended: unchecked) *Note: Selecting this option will use a new mechanism to sync audio and video playback. Check this option only if the default, unchecked option fails to achieve proper audio and video sync.*

7.2. IMB Synchronized Playback Operation

Two SX-4000 IMBs can work in sync for dual projector playback of content. This can be used for increasing the brightness of the image by overlaying the output from the projectors on the same screen, for making a video-wall or any other applications where two systems need to play in sync.

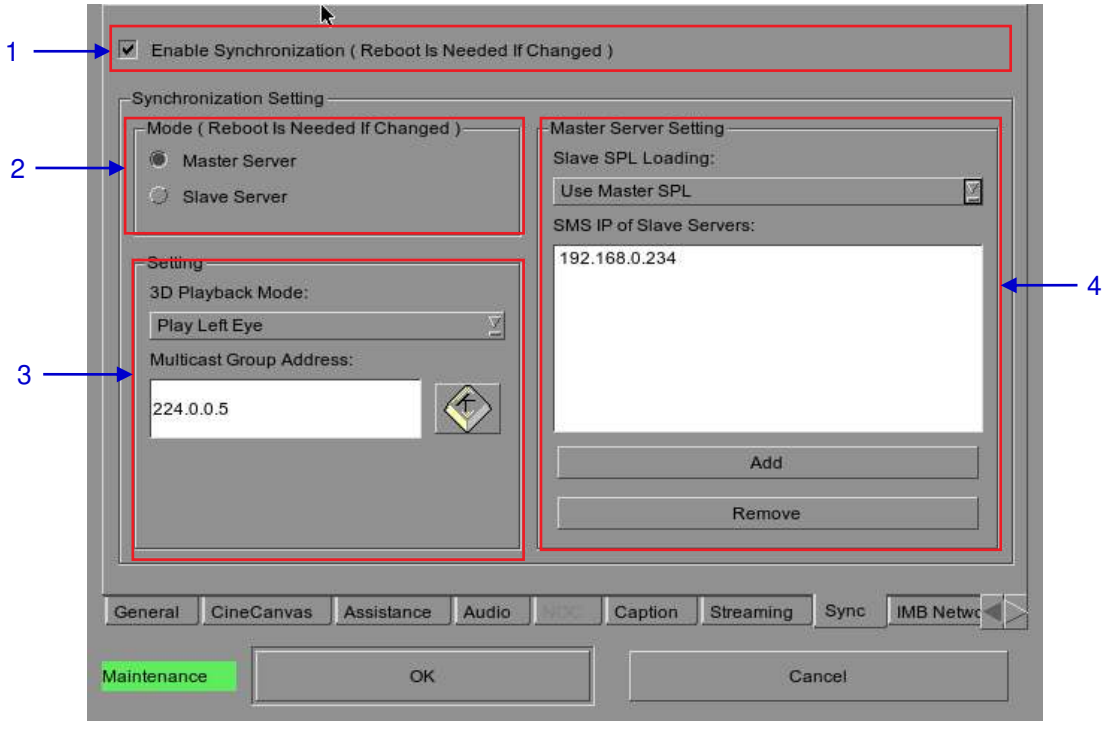
NOTE 1: The SX-4000 IMBs must be running a software version that supports IMB synchronized playback. Please check with your regional GDC office for the correct software version to be used.

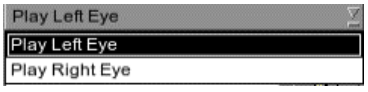
NOTE 2: IMB synchronized playback is only enabled with a license from GDC. Please check with your regional GDC office for a license to enable IMB synchronized playback.

NOTE 3: Both server systems that make up one sync solution must be the same model.

Two servers will be used for IMB synchronized playback:

- The '**master server**' will be used to control playback for the entire IMB sync system
- The '**slave server**' will be controlled by the master server to play in sync with the master



1	[Enable Synchronization]	Setting this option will enable synchronized playback with another system.
2	[Mode]	Select the IMB synchronized playback mode. The “Master Server” is used to control playback for IMB synchronized playback mode. The “Slave Server” will play in sync with the “Master Server”. Playback control must be done from the “Master Server”.
3	[3D Playback Mode]	Play the left or right eye frames for 3D playback on this server. This can be changed to match the projector placement for this server. 
	[Multicast Group Address]	Set the multicast group address where the synchronization signal is sent and received on both systems. This setting must be the same on both master and slave servers.

If the '**Use Master SPL**' option is selected during configuration, the SPL playing on the master server will be automatically copied and loaded on the slave server. SPL content must be loaded on the slave server before playback is started.

1. Create and load an SPL on the 'master' server.
2. Make sure the 'slave' server has content and KDM required for this SPL.
3. Start playback from the 'master' server.
4. The 'slave' server will automatically start playback with the same SPL on the 'master' server.

If the '**Use Slave SPL**' option is selected during configuration, the 'master' server will load and play an SPL with same name on the 'slave' server. This SPL must be prepared on the slave server before playback is started.

1. Create and load an SPL on the 'master' server.
2. Create an SPL with same name on the 'slave' server.
3. Start playback from the 'master' server.
4. The 'slave' server will automatically start playback of the SPL with the same name.

Notes: *The above operation implies that content must be downloaded on both servers used for sync playback. For encrypted content KDMs are needed for both the servers and these must be ingested to the respective servers prior to playback.*

The following table shows video output mode for 2D and 3D SPLs.
This can be used to configure projector macros for IMB synchronized playback.

	IMB sync playback with 'Play Left Eye'/'Play Right Eye' selected	IMB sync playback with 'Play 3D' selected
2D SPL	Will play as 2D on each projector	Will play as 2D on each projector
3D SPL	Will play as 2D left or right eye on each projector	Will play as 3D on each projector
SPL with 2D and 3D content	Will play as 2D on each projector (3D is played as left or right eye)	Will play as 3D on each projector (2D content is played as 3D)

7.2.1 Synchronizer Set Up

7.2.1.1 GEN10

Sync playback supports three groups of frame rate: 24/ 48fps, 25/ 50fps and 30/ 60fps. GEN10 shall be configured to be with corresponding frame rate group. (Please refer to **Figure 139**)

- GEN10 setup for 24/ 48fps
- GEN10 setup for 25/ 50fps
- GEN10 setup for 30/ 60fps

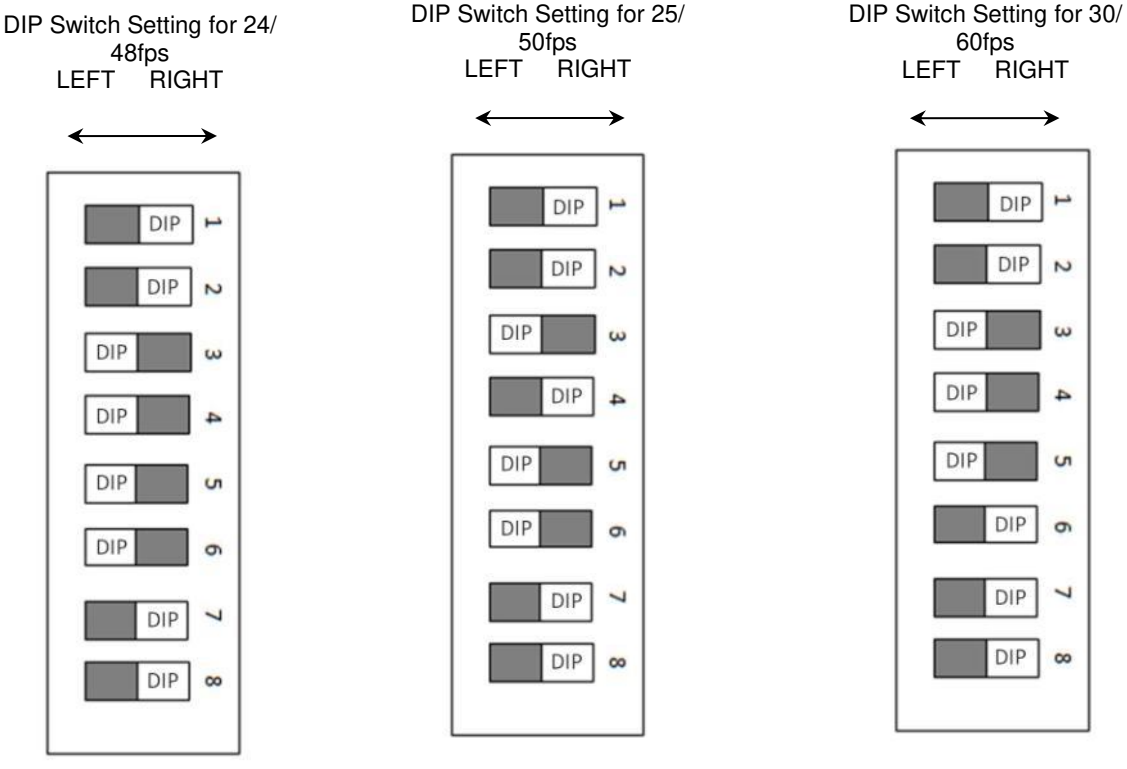


Figure 147 GEN10 configuration.

NOTE: Please set DIP switches to the WHITE position on the diagram.

7.3 DTS:X Decoding

This section provides information on configuring the SX-4000 for DTS:X internal decoding.

7.3.1. Requirements

The following items are required for DTS:X internal decoding on SX-4000 Immersive Sound Media Server.

- SX-4000 Immersive Sound Media Server.
- DTS:X Playback (Internal Decoding) LDM for the server's serial number.
- MDA configuration file for the cinema the server is to be installed in.

7.3.2. Server configuration for DTS:X playback (Internal Decoding)

7.3.2.1. Setting up the server for DTS:X playback (Internal Decoding)

1. Use the Content Manager to ingest the 'DTS:X Playback (Internal Decoding)' LDM to the server.
2. Change the setting for SMS → Configuration → Audio → DTS:X Decoding to 'Internal'.

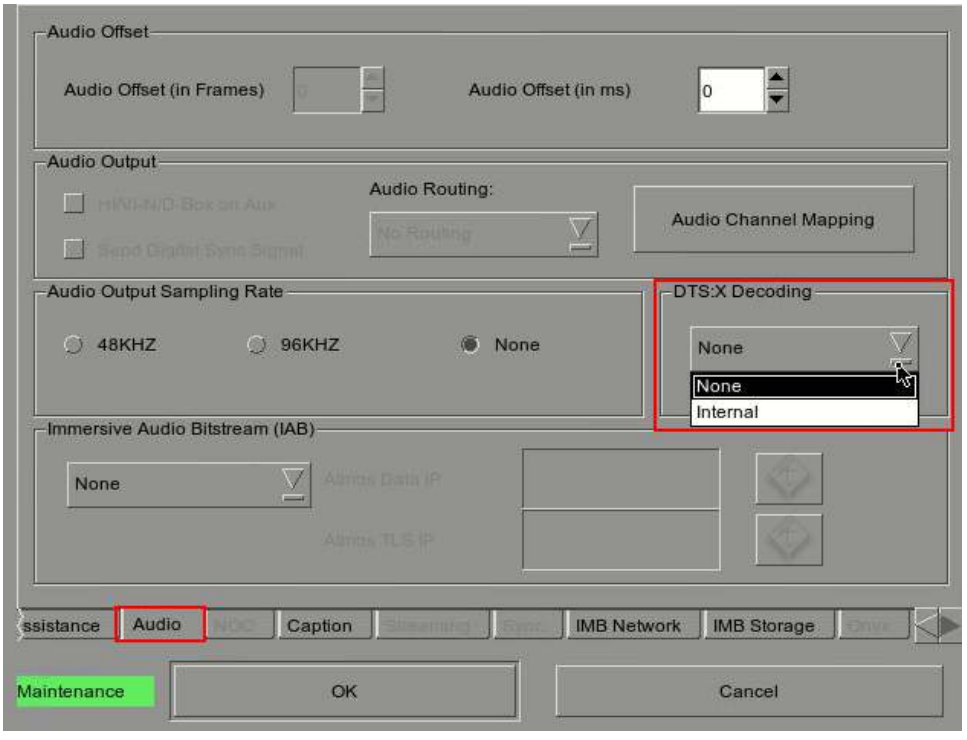


Figure 148 DTS:X (Internal Decoding) Setup

7.3.2.2. Setting up the MDA configuration file

Note: A valid MDA configuration file **must be set** before playback with DTS:X internal decoding.

Take note of the server IP address, and load the MDA configuration webpage http://<server_IP>/cgi-bin/mdaConfig on a PC connected to the server.

For example, if the server IP address is '192.168.0.139', load the webpage http://192.168.0.139/cgi-bin/mdaConfig.

The MDA configuration web page will be shown as follows:

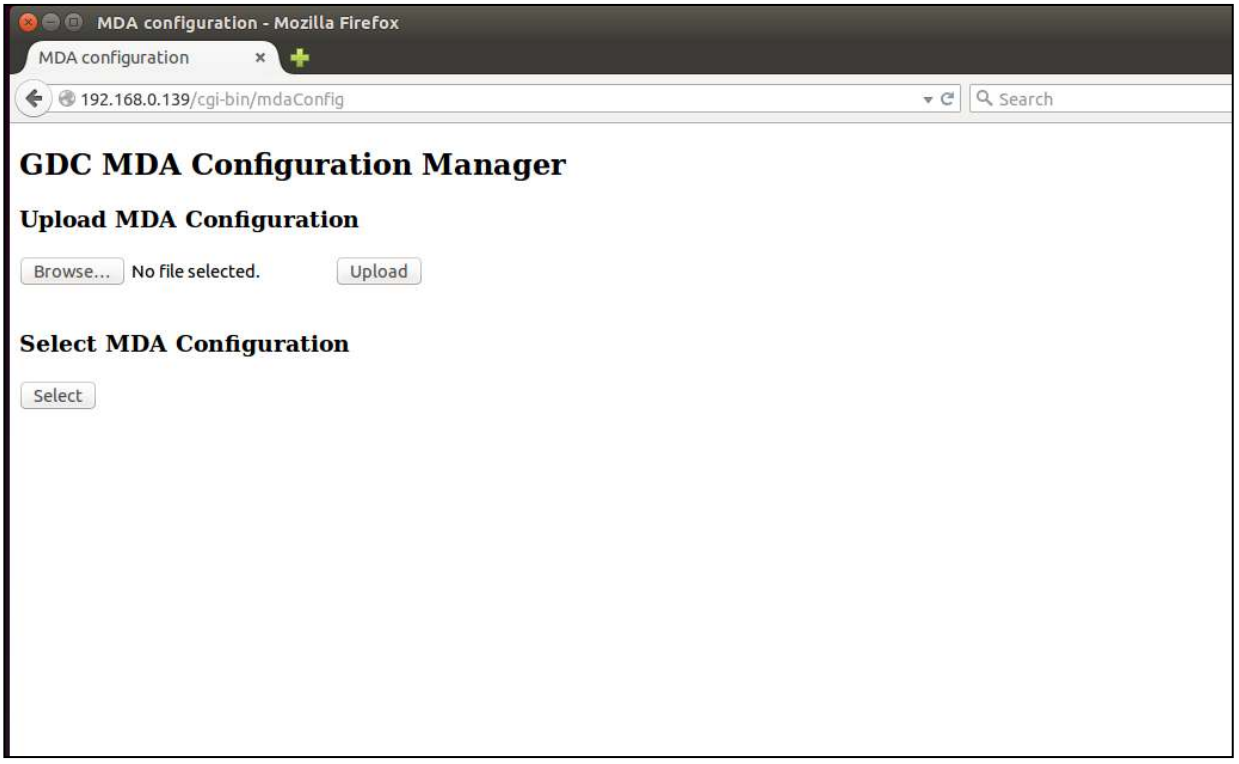


Figure 149 MDA Configuration Manager

Use the '**Upload MDA configuration**' section to upload MDA configuration files from the PC to the SX-4000 Immersive Sound Media Server.

Note: MDA configuration files must be named in the format 'mda-<XXX>.cfg'.

The '**Select MDA configuration**' section can be used to select the active MDA configuration from uploaded configuration files. In the example below, the sample 'mda-51.cfg' configuration has been set to be used for playback.

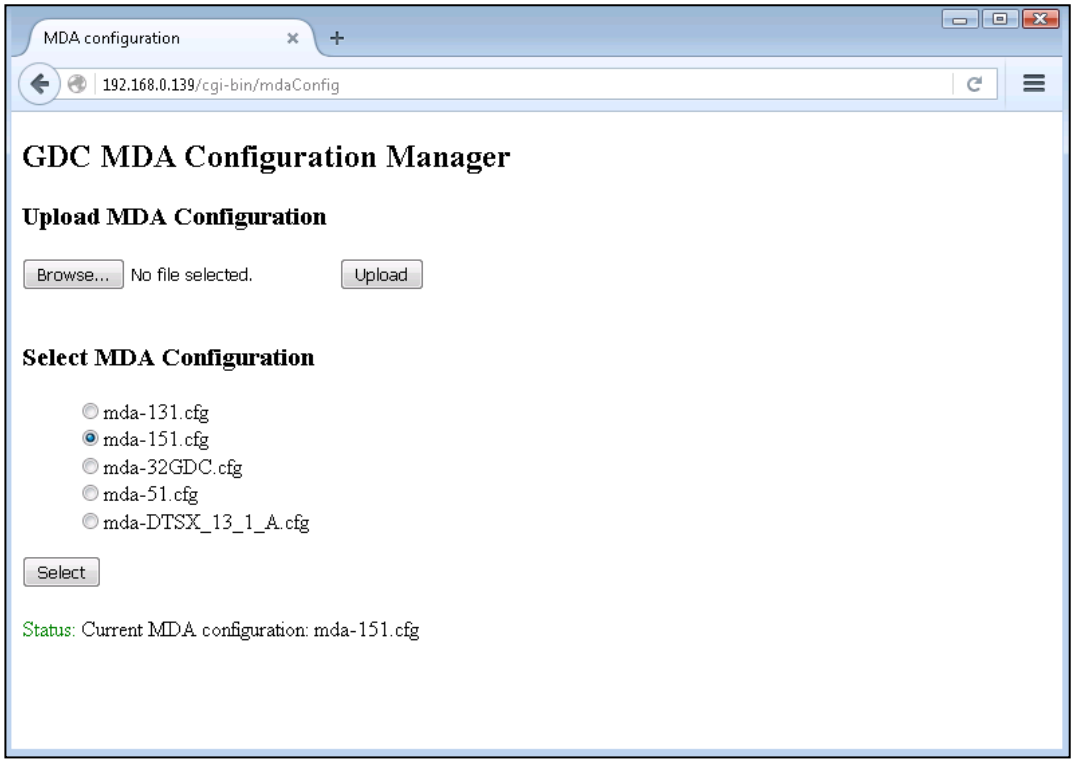


Figure 150 MDA Configuration Manager

7.3.3. Audio channel routing requirements

In order to allow for audio playback of content with 5.1 channel audio, 7.1 channel audio and DTS:X audio without speaker re-configuration, audio channel routing configuration needs to be done.

When 'Internal' for DTS:X decoding is selected, it is possible to route the HI, VI-N and D-Box signals to the AUX AES connector by checking the 'HI/VI-N/D-Box on Aux' check box or by selecting either one of the below options under the 'Audio Routing' drop down.

No Routing	**Do not route HI, VI-N or D-Box channels**
Route HI/VI-N	**Route channels 7/8 to 15/16**
Route D-Box	**Route channels 13/14 to 15/16**

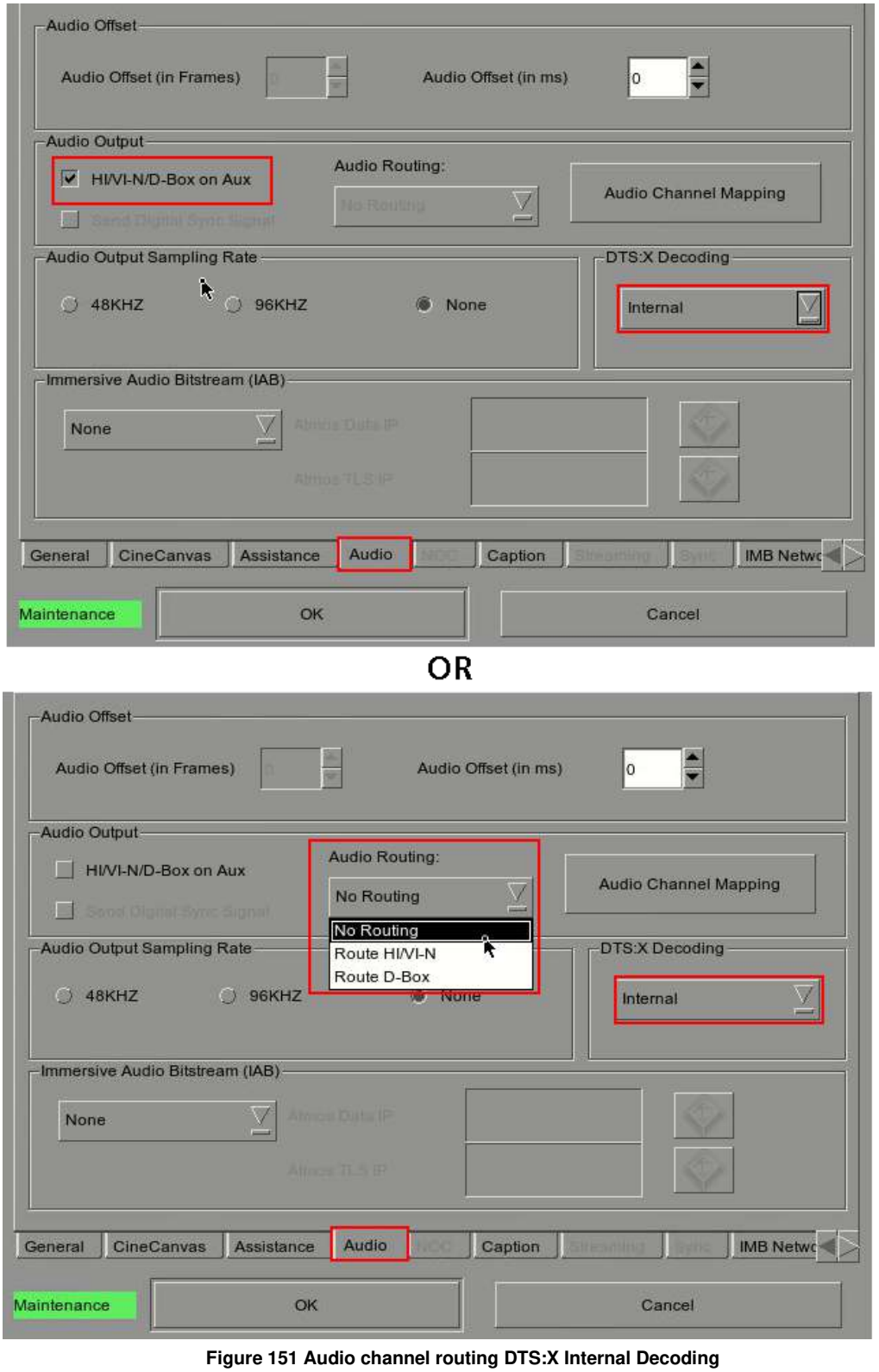


Figure 151 Audio channel routing DTS:X Internal Decoding

7.4. Immersive Audio Bitstream (IAB)

This section provides information on configuring the SX-4000 for Immersive Audio Bitstream decoding. Immersive Audio Bitstream content can be decoded by choosing either IAB (Internal) decoding with 16 channels of audio rendered internally by the SX-4000 or Dolby Atmos (External) decoding, via an external Dolby Atmos cinema processor such as the CP850.

7.4.1. Requirements

The following items are required for IAB DCP playback on SX-4000 Immersive Sound Media Server.

- SX-4000 Immersive Sound Media Server (SMS Version: 10.00-build120 or higher)
- IAB Playback and/or Dolby Atmos LDM for the server's serial number
- IAB configuration file for the auditorium the server is to be installed in, in case the IAB (Internal) decoding is used.

7.4.2. Server configuration for IAB playback

7.4.2.1. Setting up the server for IAB playback

1. Use the Content Manager to ingest the 'IAB Playback' or 'Dolby Atmos' LDM to the server.
2. Choose an option in the settings for SMS → Configuration → Audio → Immersive Audio Bitstream (IAB) to 'IAB (Internal)' or 'Dolby Atmos (External)' depending on the decoding desired.
3. If 'Dolby Atmos (External)' is selected, please refer to the GDC technical bulletin on Setting up Dolby Atmos on the SX-4000.

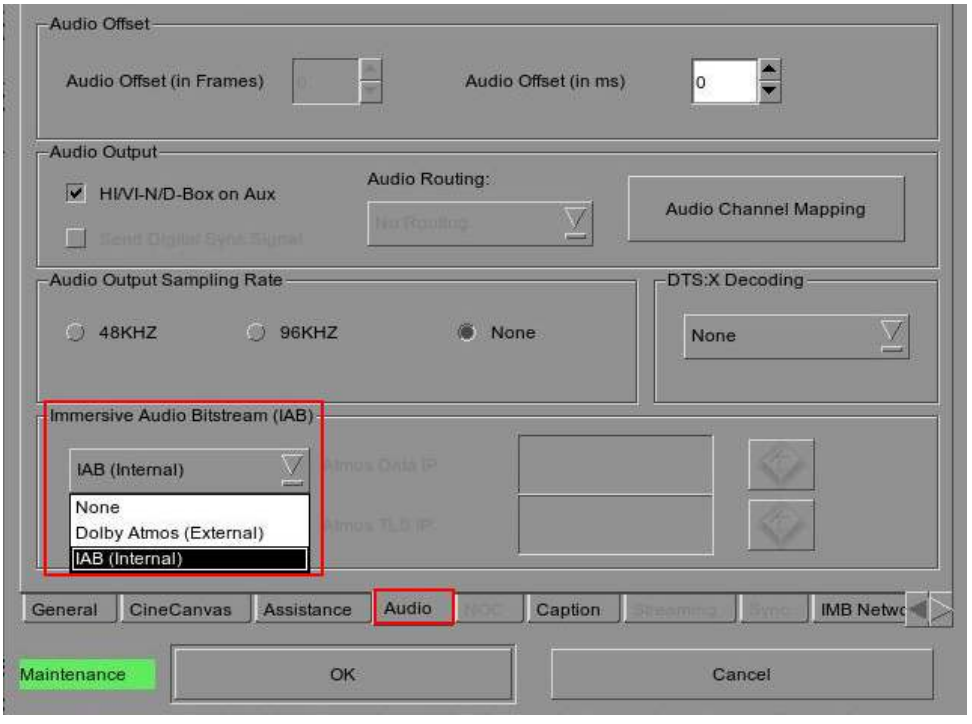


Figure 152 Setting up server for IAB playback

7.4.2.2. Setting up the IAB configuration file when IAB (Internal) is selected

Note: A valid IAB configuration file **must be set** before playback with IAB (Internal) decoding.

Take note of the server IP address, and load the IAB configuration webpage http://<server IP>/cgi-bin/iabConfig. on a PC connected to the server.

For example, if the server IP address is '192.168.2.112', load the webpage http://192.168.2.112/cgi-bin/iabConfig.

The IAB configuration web page will be shown as follows:

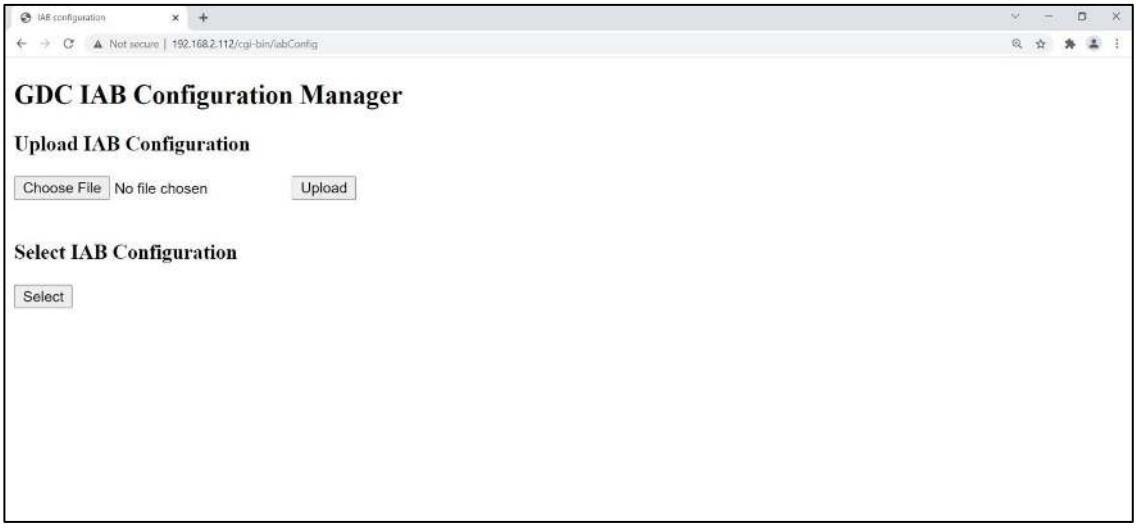


Figure 153 IAB Configuration Manager

Use the '**Upload IAB configuration**' section to upload IAB configuration files from the PC to the SX-4000 Immersive Sound Media Server.

NOTE: IAB configuration files must be named in the format 'iab-<XXX>.cfg'.

The '**Select IAB configuration**' section can be used to select the active IAB configuration from uploaded configuration files. In the example below, the sample 'iab-151.cfg' configuration has been set to be used for playback.

NOTE: The IAB configuration file must be a 15.1 (16 channel) configuration

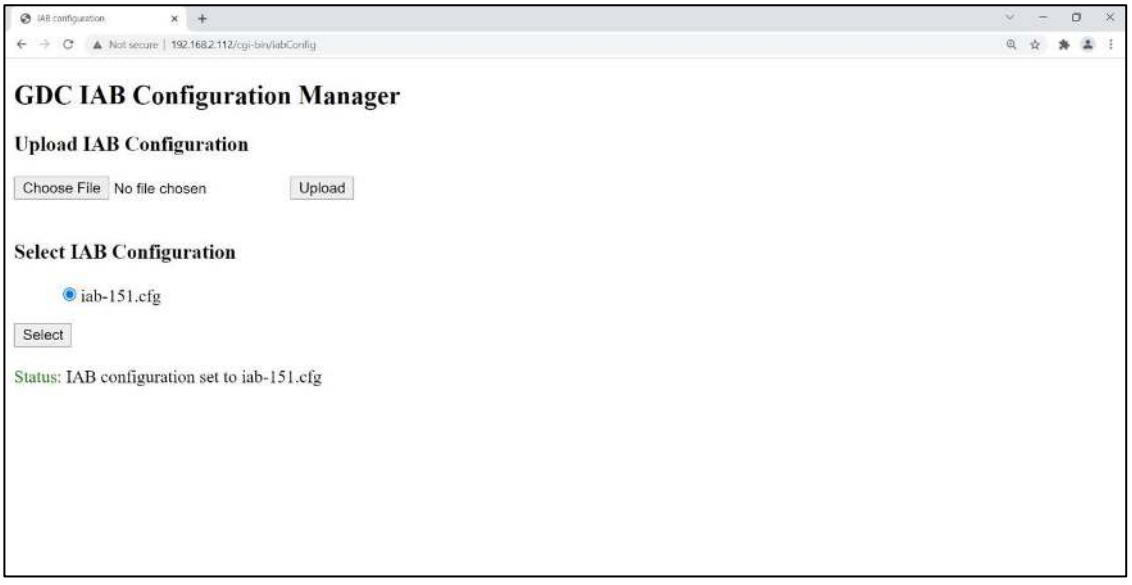


Figure 154 IAB Configuration Manager

7.4.3. Audio channel routing requirements

In order to allow for audio playback of content with 5.1 channel audio, 7.1 channel audio and IAB (Internal) audio without speaker re-configuration, audio channel routing configuration needs to be done.

When 'IAB (Internal)' for Immersive Audio Bitstream (IAB) is selected, it is possible to route the HI, VI-N and D-Box signals to the AUX AES connector by checking the 'HI/VI-N/D-Box on Aux' check box.

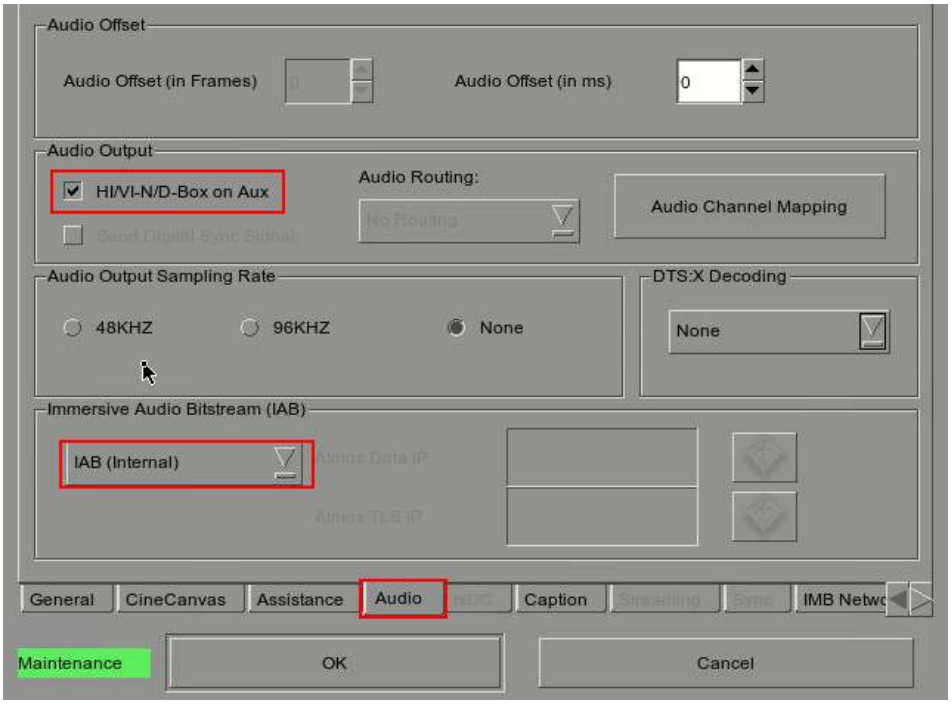


Figure 155 HI/VI-N/D-Box on Aux option for IAB Internal

7.5 Audio Upmix

This section provides information on configuring the SX-4000 for audio upmix.

7.5.1. Requirement

- License for MDA playback (internal rendering)

7.5.2. Setup

7.5.2.1. Enable audio upmix

1. Audio upmix is enabled in SMS → Configuration → Audio tab → Audio Channel Mapping → Upmix.
2. Check the 'Enable Upmix' checkbox to enable audio upmix.
3. Enter a valid IP address for the Sound Processor IP field.

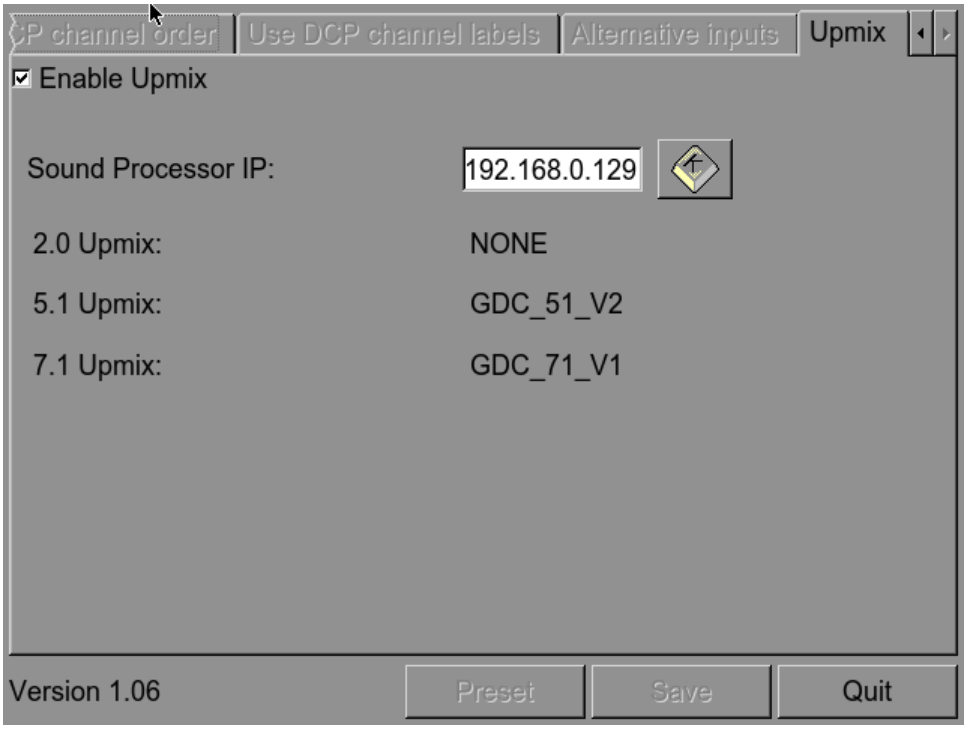


Figure 156 Upmixing

NOTE: All other audio channel routing options are disabled when Audio Upmix is enabled.

7.5.2.2. Set CPL audio track properties

This feature allows the user to define audio track properties for each CPL in an SPL.

This can be done from SMS Playlist Management → CPL Properties → Audio tab.

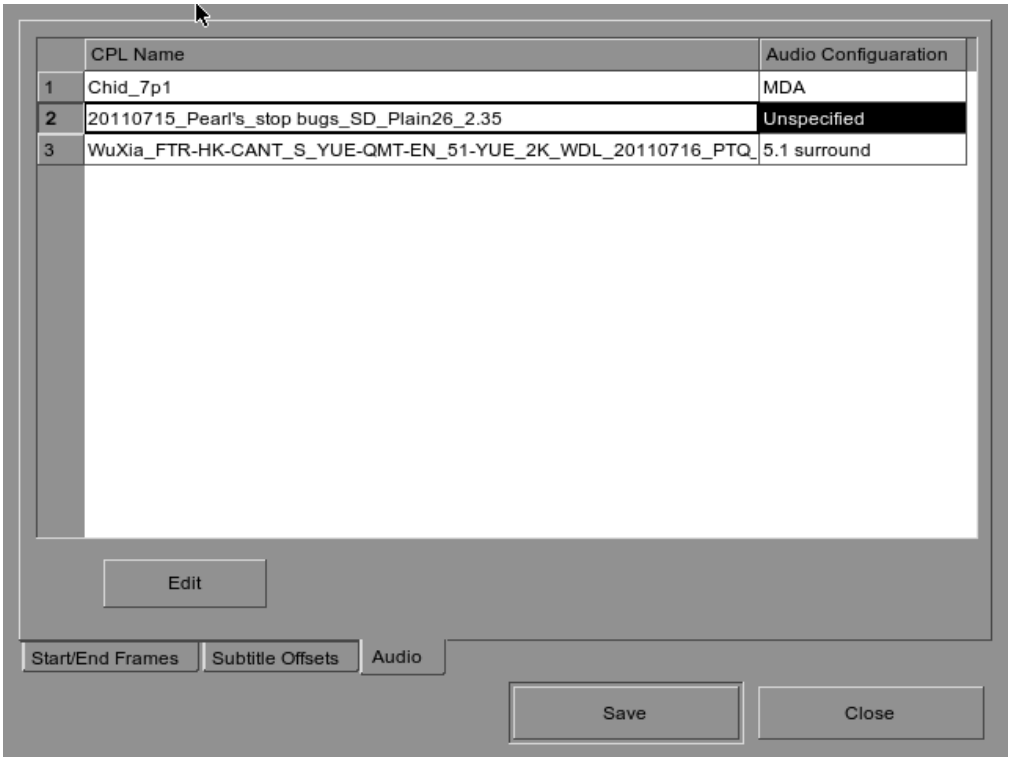


Figure 157 CPL audio track properties setting

Audio track properties can be changed for each CPL if they are not detected correctly.

For example, if a CPL is known to contain 7.1 surround audio, change the 'Audio Channel Configuration' setting to '7.1 surround'.

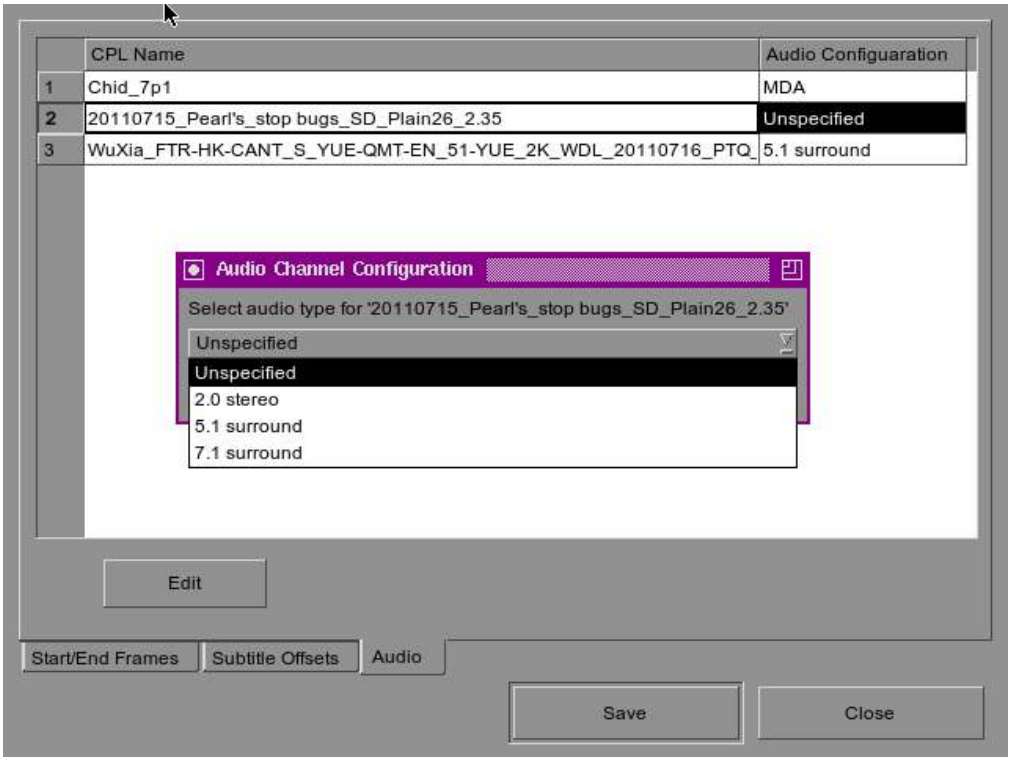


Figure 158 CPL audio track properties setting

The audio channel configurations available for each CPL are as follows:

Audio channel configuration	Audio upmix applied
Unspecified	No audio upmix applied
2.0 stereo	No audio upmix applied
5.1 surround	Upmixed from 5.1 surround to 13.1
7.1 surround	Upmixed from 7.1 surround to 13.1

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