

SIERRA VIDEO



SIERRAVIDEO

**SIERRA VIDEO**

---

SMP-xx/MP-xx MultiViewer Family

# **User's Manual**



**SIERRA VIDEO**

**SMP/MP-XX MULTIVIEWER**

# **User's Manual**

---

© Sierra Video

Tel: (530) 478-1000

Fax: (530) 478-1105

Email: [info@sierravideo.com](mailto:info@sierravideo.com)

Sierra Video is a Kramer Electronics Brand

Kramer Electronics Ltd

3 Am VeOlamo St, Jerusalem, Israel, 9546303

Version 9.0

Publication Date: April 2016

The information contained in this manual is subject to change by Sierra Video

## Regulatory Warnings & Safety Information

The information in the following section provides important warnings and safety guidelines for both the operator and service personnel. Specific warnings and cautions may be found throughout this manual. Read and follow the important safety precautions noting especially those instructions relating to risk of fire, electrical shock and injury to persons.

Any instructions in this manual that require opening the equipment cover or enclosure are intended for use by qualified service personnel only. To reduce the risk of electrical shock, do not perform any servicing other than what is contained in the operating instructions unless you are qualified.



### Warnings

- Heed all warnings on the unit and in the operating instructions.
- Disconnect AC power before installing or removing device or servicing unit.
- Do not use this product in or near water.
- This product is grounded through the grounding conductor of the power cord. To avoid electrical shock, plug the power cord into a properly wired receptacle before connecting inputs or outputs.
- Route power cords and other cables so that they are not likely to be damaged, or create a hazard.
- Dangerous voltages exist at several points in this product. To avoid personal injury, do not touch unsafe connections and components when the power is on.
- Have qualified personnel perform safety checks after any completed service.
- To reduce risk of electrical shock, be certain to plug each power supply cord into a separate branch circuit employing a separate service ground.
- If equipped with redundant power, this unit has two power cords. To reduce the risk of electrical shock, disconnect both power cords before servicing.
- Operate only with covers and enclosure panels in place – Do Not operate this product when covers or enclosure panels are removed.
- This is an FCC class A product. In a domestic environment, this product may cause radio interference, in which case the user may be required to take necessary measures.



## Cautions

- Use the proper AC voltage to supply power to the MultiViewer. When installing equipment, do not attach the power cord to building surfaces.
- Use only the recommended interconnect cables to connect the MultiViewer to other frames.
- Follow static precautions at all times when handling the equipment.
- Power this product only as described in the installation section of this manual.
- Leave the sides of the frame clear for air convection cooling and to allow room for cabling. Slot and openings in the frame are provided for ventilation and should not be blocked.
- Only an authorized Kramer or Sierra Video technician should service this product. Any user who makes changes or modifications to the unit without the expressed approval of Kramer or Sierra Video voids the warranty.
- If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than the room ambient temperature. Therefore, consideration should be given to installing the equipment in an environment compatible with the manufacturer's maximum rated ambient temperature (TMRA).
- Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.
- Other connections between peripherals of this equipment may be made with low voltage non-shielded computer data cables.
- Network connections may consist of a suitable networking cable such as CAT5, CAT5E and CAT6 etc.
- Do not cover chassis ventilation slots or block enclosure openings.

# **CAUTION**

This equipment contains a lithium battery

**There is a danger of explosion if this is replaced incorrectly**

Replace only with the same type from the same manufacturer.

Dispose of used batteries in accordance with local  
and national laws/regulations.

Batteries **should only** be replaced by trained service technicians

## FCC Notice

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 the expense of the user.

The user may find the following publication prepared by the Federal Communications Commission helpful:

“How to Identify and Resolve Radio-TV Interference Problems” (Stock number 004-000-00345-4).

Available exclusively from the Superintendent of Documents, Government Printing Office, Washington, DC 20402 (telephone 202 512-1800).

## Warning

Changes or modifications not expressly approved by the party responsible for compliance to Part 15 of the FCC Rules could void the user’s authority to operate the equipment.

## Power Supply Cords

Use only power cord(s) supplied with the unit.

If power cord(s) were not supplied with the unit, select as follows:

For units installed in the USA and Canada: select a flexible, three-conductor power cord that is UL listed and CSA certified, with individual conductor wire size of #18 AWG, and a maximum length of 4.5 meters. The power cord terminations should be NEMA Type 5-15P (three-prong ground) at one end and IEC appliance inlet coupler at the other end. Any of the following types of power cords are acceptable; SV, SVE, SVO, SVT, SVTO, SVTOO, S, SE, SO, SOO, ST, STO, STOO, SJ, SJE, SJO, SJOO, SJT, SJTOO, SP-3, G, W.

For units installed in all other countries; select only a flexible, three-conductor power cord, approved by the cognizant safety organization of your country. The power cord must be Type HAR (Harmonized), with individual conductor wire size of 0.75 mm<sup>2</sup>. The power cord terminations should be a suitably rated earthing-type plug at one end and IEC appliance inlet coupler at the other end. Both of the power cord terminations must carry the certification label (mark) of the cognizant safety organization of your country.

A non-shielded power cord may be used to connect AC power to every component and peripheral of the system.

Connect an external 16 AWG or larger wire from earth ground to the chassis of the system as designated by the earth ground symbol.

## North American Power Supply Cords

This equipment is supplied with North American power cords with molded grounded plug (NEMA-15P) at one end and molded grounding connector (IEC 320-C13) at the other end. Conductors are CEE color coded, light blue (neutral), brown (line), and green/yellow (ground). Operation of the equipment at voltages exceeding 130V AC requires power supply cords that comply with NEMA configurations

## **International Power Supply Cords**

If shipped outside North America, this equipment is supplied with molded ground connector (IEC 320-C13) at one end and stripped connectors (50/5mm) at the other end. Connections are CEE color coded, light blue (neutral), brown (line), and green/yellow (ground). Other IEC 320-C13 type power cords can be used if they comply with safety regulations of the country in which they are installed.

## **EMC Regulatory Notices**

Federal Communications Commission (FCC) Part 15 Information: This device complies with Part 15 of the FCC standard rules. Operation is subject to the following conditions:

This device may not cause harmful interference

This device must accept any interference received including interference that may cause undesirable operations.

## **Delivery Damage Inspection**

Carefully inspect the frame and exterior components to be sure that there has been no shipping damage.

## Standards Compliance

This equipment complies with the following standards:



**EN60950-1 2006**

Safety of information Technology Equipment Including Electrical Business Equipment.

**UL1419** (3rd Edition) - UL File E193966

Standard for Safety - Professional Video and Audio equipment

### **EMC Standards**

This unit conforms to the following standards:

**EN55103-1:2009** (Environment E4)

Electromagnetic Compatibility, Product family standard for audio, video, audio-visual and entertainment lighting control apparatus for professional use. Part 1. Emission

**EN55103-2:2009** (Environment E2)

Electromagnetic Compatibility, Product family standard for audio, video, audio-visual and entertainment lighting control apparatus for professional use. Part 2. Immunity

**Federal Communications Commission Rules** 47 CFR: 2009, Part 15, Subpart B (Class A)

### **EMC Performance of Cables and Connectors**

Sierra Video products are designed to meet or exceed the requirements of the appropriate European EMC standards. In order to achieve this performance in real installations it is essential to use cables and connectors with good EMC characteristics such as Kramer Cables.

### **FCC Compliance**

In order to comply with FCC/CFR47: Part 15 regulations, it is necessary to use High quality HDMI/DVI cables such as Kramer cables

**Table of Contents**

<b>Regulatory Warnings &amp; Safety Information</b>	<b>i</b>
<b>FCC Notice</b>	<b>iii</b>
<b>Warning</b>	<b>iii</b>
<b>Power Supply Cords</b>	<b>iii</b>
North American Power Supply Cords	iii
International Power Supply Cords	iv
<b>EMC Regulatory Notices</b>	<b>iv</b>
<b>Delivery Damage Inspection</b>	<b>iv</b>
<b>Standards Compliance</b>	<b>v</b>
<b>Overview</b>	<b>1</b>
<b>SMP-xx/MP-xx MultiViewer Family</b>	<b>1</b>
Introduction	1
SMP-xx 1RU MultiViewer	1
MP-xx 3RU MultiViewer	2
General	3
<b>System Concept</b>	<b>3</b>
SMP-xx 1RU MultiViewer	3
MP-xx 3RU MultiViewer	4
<b>Integrated SDI Router – (SMP-Rxx Variant)</b>	<b>5</b>
Additional Features	6
<b>Features and Benefits Summary</b>	<b>10</b>
<b>Installation</b>	<b>11</b>
<b>Introduction</b>	<b>11</b>
Ventilation	11
Rack Mounting	13
Power and Fuses	13
Back Up Power Supply	15
<b>Configuration</b>	<b>16</b>
<b>Connector I/O</b>	<b>16</b>
<b>SMP-xx MultiViewer</b>	<b>16</b>
<b>MP-xx MultiViewer</b>	<b>17</b>
<b>Connector Panel Modules</b>	<b>18</b>
Standard Connector Panels	18
High Density Connector Panels	23
<b>Audio Connector Panel</b>	<b>25</b>
<b>Input/Output Card Configurations</b>	<b>26</b>
Video Inputs	27
Video Outputs	28
Audio Inputs	28
Audio Outputs	29
Serial Port Assignments	31
Global Pin Assignments	32
Audio I/O Connector Panel Connector Pin Assignments	33
Hardware Configuration	34
Summary of Rear Connector Modules	43
<b>Operation</b>	<b>45</b>
<b>Initial Setup</b>	<b>48</b>
Network Settings	49
Keyboard Operation	49
Using the Web Interface	50
Object and Source Explorer	52
Navigating the User Interface	53
<b>Main Menus</b>	<b>53</b>

**SIERRA VIDEO**

Module Menu	53
Set Time	55
Layout Menu	56
Group Menu	57
Object Menu	58
Grid Menu	59
16x16 SDI I/O Router Menu (SMP-Rxx 1RU MultiViewer option only)	60
Help Menu	62
Module Properties	63
<b>Uploading Files</b>	<b>100</b>
Graphics Files	100
Configuration Files	100
<b>Upgrading Firmware</b>	<b>100</b>
<b>Communication Protocols</b>	<b>102</b>
<b>Open “Hydra” Protocol</b>	<b>102</b>
Introduction	102
Formatting	102
Connections	102
Transactions	103
<b>Commands</b>	<b>104</b>
Command Summary	105
Object Related Commands	106
Source Related Commands	109
Module Related Commands	111
<b>Parameter Values</b>	<b>114</b>
Color Values	114
<b>TSL Protocol</b>	<b>114</b>
Via Serial	114
Via Ethernet	118
<b>Specifications</b>	<b>121</b>
<b>Main Frame (SMP-xx and MP-xx MultiViewers)</b>	<b>121</b>
<b>Backup Power Supply (POWER-xx)</b>	<b>126</b>
<b>Troubleshooting</b>	<b>127</b>
<b>Sample Problems and their Solutions</b>	<b>129</b>
<b>Limited Warranty</b>	<b>132</b>
<b>Appendix A: PCB profiles</b>	<b>133</b>
Main Cards	133
Connector Panel Cards	134
<b>Appendix B: Audio Input Channel Numbering</b>	<b>143</b>
<b>Appendix C: Audio Routing When Using the SMP-Rxx</b>	<b>149</b>
Available Audio Channels When Using the SMP-Rxx	149
Audio Input Cards	149
Audio Output Cards	151
<b>Appendix D: Firmware Updates on the MPX–NET and MPX-MVC Main Cards</b>	<b>153</b>
Procedure for Updating Firmware	153
<b>Appendix E: Audio Card Configuration</b>	<b>157</b>
Audio Input Cards	157
Audio Output Cards	163
<b>Appendix F: HDMI Cable Retention</b>	<b>167</b>
The HDMI Interface	167
Kramer K-Lock Cables	167
HDMI Connector with Integral Screw Fitting	168
Traditional HDMI Mating Connectors	169

**SIERRA VIDEO**

**Appendix G: MV HDMI and SDI Video Output Standards**  
**Appendix H: Connector Panel Identification**

**171**  
**172**

# Overview

## SMP-xx/MP-xx MultiViewer Family

### Introduction

The SMP-xx & MP-xx MultiViewers are state of the art in flexible MultiViewer design.

A unique feature of the modular design is that a number of MultiViewer instances can be created within the same frame. This is limited only by the number of available frame slots. The two frame sizes offer the flexibility to tailor MultiViewer configurations to match the space available and future expansion requirements.

All main and connector panel interface cards are modular and interchangeable between both MultiViewer versions as are the hot-swappable internal and external power supplies.

### SMP-xx 1RU MultiViewer



The SMP-xx can be configured as a single MultiViewer allowing up to 16 channels of video to be viewed simultaneously on one, or two independent, displays. Each video source may appear in either, or both, displays.

Alternatively, it can be configured to support two MultiViewer instances within the same chassis. Each MultiViewer instance supports two independent HDMI outputs, allowing any of the video sources to be displayed with any aspect ratio on either display. Each

## SIERRA VIDEO

HDMI output is also paired with a parallel HD-SDI output to support longer cable runs or to feed an external HD-SDI routing matrix.

The SMP-xx frame accepts up to 4 video processing cards with each card responsible for processing 4 input channels. Each video processing card has an associated connector panel card which provides the input and output connections for the video sources.

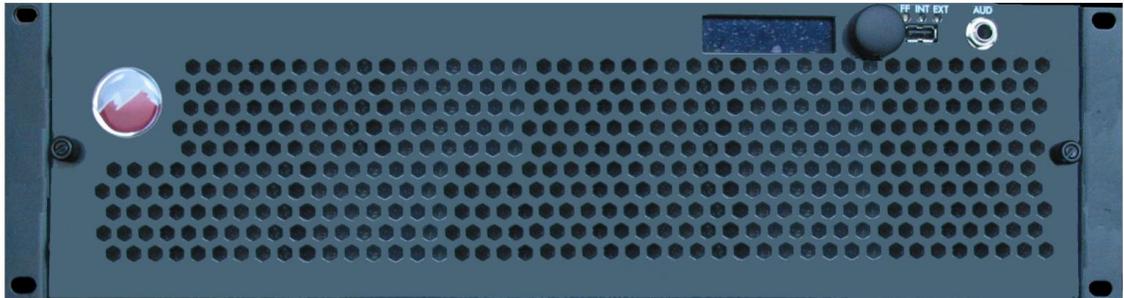
There are two frame options available in the SMP-xx range;

**SMP-Sxx** 1RU SMP-xx non-routing frame

**SMP-Rxx** 1RU SMP-xx frame with integrated 16x16 HD-SDI router

A unique feature of the optional SMP-Rxx frame is the inclusion of an independent 16x16 router for HD-SDI signals up to 3G. When the SMP-Rxx router version is used and fitted with the appropriate router connector panel cards a single 1RU MultiViewer chassis may be used as a stand-alone 16x16 HD-SDI router as well as operating as a 16 input MultiViewer. The optional HD-SDI router is controlled via the MultiViewer browser using a separate control matrix allowing simple control and monitoring of the router configuration.

## MP-xx 3RU MultiViewer



The MP-xx can be configured as a single unit allowing up to 72 channels of video to be viewed simultaneously on one, or two independent, displays. Each video source may appear in either, or both, displays. Alternatively it can be configured to support multiple MultiViewer instances within the same chassis. In fact, with the available slots, up to 9 MultiViewer instances can be configured in the MP-xx.

Each MultiViewer instance has two independent HDMI outputs, allowing any of the video sources to be displayed with any aspect ratio on either display. Each HDMI output is also paired with a parallel HD-SDI output to support longer cable runs or to feed an external HD-SDI routing matrix.

The MP-xx frame accepts up to 18 video processing cards with each card responsible for processing 4 input channels. Each video processing card has an associated connector panel card which provides the input and output connections for the video sources.

**Note:** The internal HD-SDI router option offered for the SMP-xx frame is not available in the MP-xx frame

## **General**

The same wide range of connector panel cards may be used in any of the frames to support many different video formats and to provide additional functionality such as GPI/O.

**Note:** The Router connector panels serve no router function in either the MP-xx frame or the non-router SMP-Sxx frame.

Video sources may be a mixture of HDMI, HD-SDI, RGBHV (525/625 lines video level), Analog Component (YUV), or composite video. All video inputs are auto-sensing and all inputs can be configured to display audio level metering and comprehensive alarm monitoring in-picture.

Other optional cards allow analog or digital audio inputs to be metered in separate tiles or overlaid on existing video tiles.

Audio monitoring of up to 192 channels is achieved using analog or digital audio output cards (96 AES pairs or 96 analog channels).

Power redundancy is achieved by using the optional external rack mount power supply (**POWER-xx**).

The MV is easily controlled from an integral PC web browser, either directly via an Ethernet cable or over a network.

## **System Concept**

The video and audio architecture is the same for both the SMP-xx MultiViewer and the MP-xx MultiViewer. The only difference being the total number of cards supported by each frame. Both frames are capable of supporting more than one independent MultiViewer offering a high level of flexibility and cost saving.

### **SMP-xx 1RU MultiViewer**

The SMP-xx has a total of six card slots at the front and connector panel of the unit. One of the slots is always reserved for the network or gateway card (**MPX-NET**) leaving five slots available for video or audio processing cards. The **MPX-NET** network card has an associated connector panel (**RMP-NET**) with connectors for timecode and video reference inputs as well as LAN, Serial and GPI/O connections.

When configured as a single MultiViewer, one of the slots is used to host the video output card (**MPX-MVC**) which has two independently configurable outputs. Each of these independent outputs offers both HD-SDI and HDMI in parallel. The **MPX-MVC** output card has an associated connector panel (**RMP-MVC**). The remaining four slots are available for audio or video processing cards or a combination of both.

The SMP-xx MultiViewer can also be configured as a two independent MultiViewer systems by adding an additional video output card. Each MultiViewer can access the video sources from the input cards that are located directly upstream. Supported configurations include two quad channel MultiViewers or an eight channel and a four channel MultiViewer within the same frame.

## SIERRA VIDEO

Each MultiViewer instance has two independent outputs whereby any of the video sources may be assigned to each output, or both outputs simultaneously.

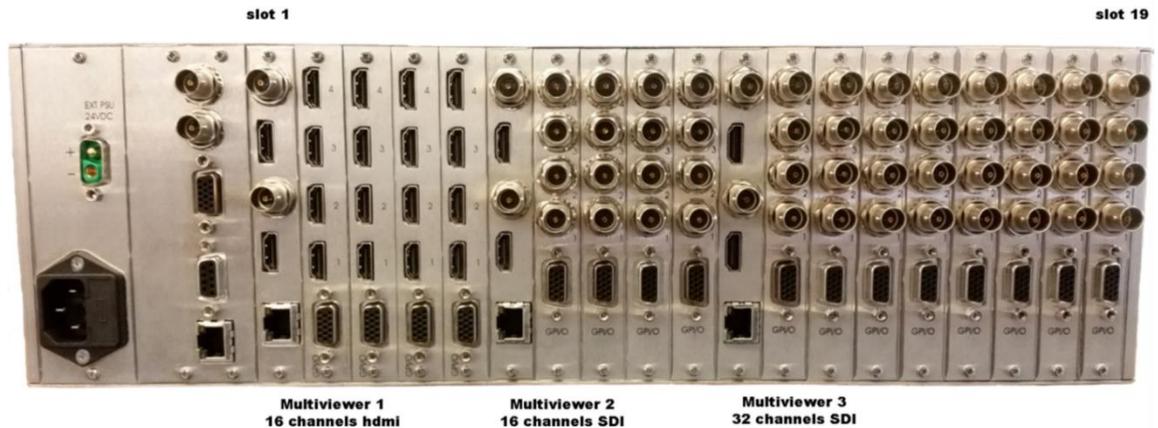
### MP-xx 3RU MultiViewer

The MP-xx has a total of twenty slots at the front and connector panel of the unit. One of the slots is always reserved for the **MPX-NET** network card and **RMP-NET** connector panel leaving nineteen available slots for other cards. As with the SMP-xx frame, each MultiViewer instance requires a **MPX-MVC** video output card and **RMP-MVC** connector panel, leaving up to eighteen slots for audio or video processing cards.

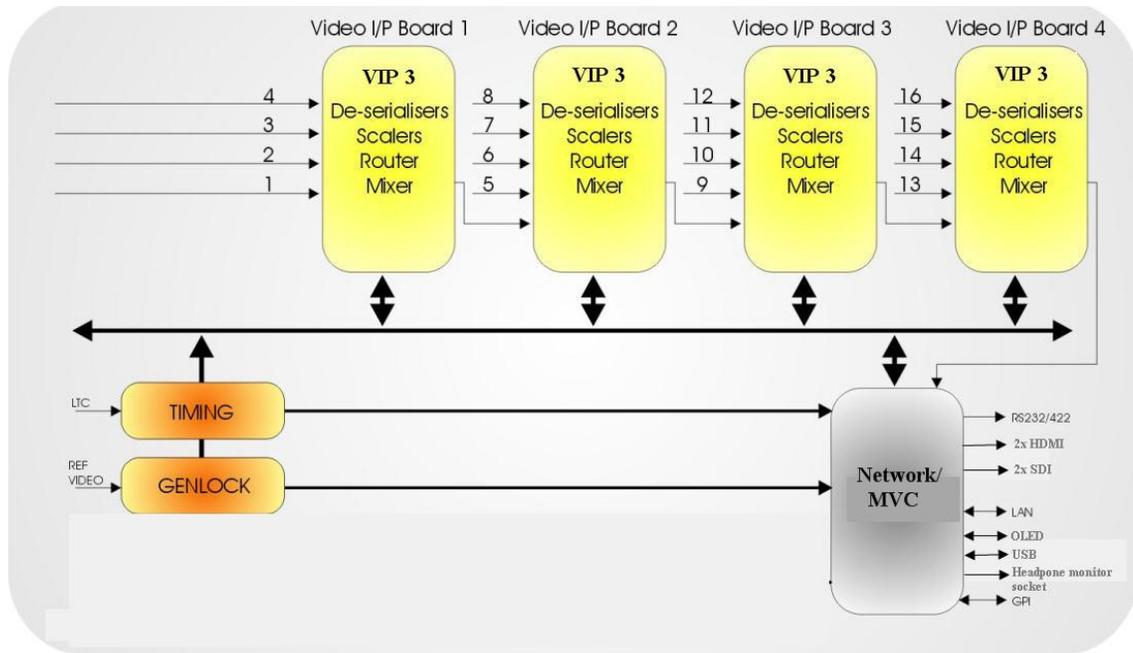
For multiple MultiViewer instances, all nineteen slots are available for configuration. Each MultiViewer instance must have a **MPX-MVC** card and **RMP-MVC** connector panel and at least one VIP card and associated connector panel.

**e.g.** In a dual MultiViewer configuration, the chassis could be populated with one MVC card and up to eight VIP cards in one half of the chassis (giving a 32x2 MultiViewer), and one MVC output card and up to nine VIP cards in the other half of the chassis (giving a 36x2 MultiViewer).

Alternatively the same chassis could be configured to support nine quad MultiViewers, each comprising one MVC output card and one VIP, leaving 1 spare slot available for an additional video or audio card for one of the MultiViewers. An example multiple output card configuration is shown below to help visually explain this:



Scalers on each video processing card resize the sources to the desired tile size for the selected position on the display output. Each video-processing card has two independent input and output cascade channels to which video tiles can be assigned according to the user display configuration. Two video mixers on each card combine the cascade inputs with the resized video sources and use the cascade outputs to send the resulting images to the next video card where the process is repeated until they reach the MultiViewer Output card (MVC).



The MV System Video Concept

**SMP-xx MultiViewer** - up to 4 video processing cards

**MP-xx MultiViewer** – up to 18 video processing cards

Overlay of audio and graphics information is performed inside each scaler, which receives control data from the main CPU in real-time for external audio sources, or from the video card in the case of embedded SDI/HD-SDI/HDMI audio. To allow arbitrary layering of sources, each scaler card has information about all of the tile positions, allowing each tile to be displayed as required and enabling picture overlay with complex borders.

At the output of the last card, both display outputs contain all of the tiles required for each display. Each video-processing card supports audio level metering of up to 16 channels of embedded audio per video input up to a maximum of 64 channels per card.

The video-processing cards support sources of differing frame rates and resolutions. For example, sources with either 50Hz or 60Hz frame rates may be synchronised to an external video reference, using frame add or repeat to maintain frame synchronism.

## Integrated SDI Router – (SMP-Rxx Variant)

Where space is a premium, the optional SMP-Rxx MultiViewer frame is available. The SMP-Rxx features an integrated 16x16 router for routing HD-SDI signals up to 3G. All of the router outputs are accessible using dedicated router connector panels which are fitted with four HD-SDI inputs and four HD-SDI router outputs. With 4 router connector panels fitted all 16 router outputs are accessible. All router outputs are preceded by digital reclockers and offer very high cable run performance. The router is independent of the MultiViewer and does not require any video processing cards to be fitted, although

## SIERRA VIDEO

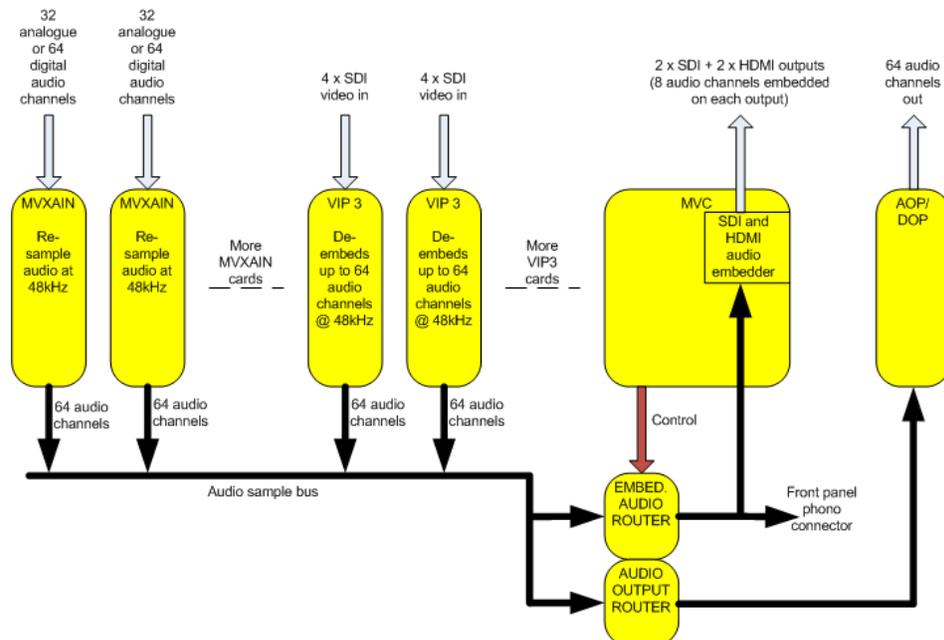
MPX-MVC and MPX-NET cards must still be present. The router is controlled via a separate tab in the browser control.

The SMP-Rxx also contains a second integrated 16x16 router that is fully controlled by the MultiViewer and is used to route HD-SDI video sources to the MultiViewer inputs. This integrated router provides many benefits such as allowing input sources to be displayed on both display outputs with arbitrary aspect ratio or allowing a wider pool of video sources to be accessed without the overhead of additional video processing cards. For example, if all connector panels are fitted then any of the 16 inputs may be routed to one or more video processing cards.

## Additional Features

### Audio Handling

Comprehensive audio signal handling is supported. Embedded audio is extracted from SDI and HDMI inputs and dedicated optional analog and digital input cards provide support for external balanced and un-balanced audio. This allows any external audio inputs to be processed by the MV alongside the extracted embedded audio data. Each analog audio input card can accept up to 32 channels with the digital input cards handling up to 32 AES pairs (64 digital channels). The maximum number of audio input channels (from any source) supported is 1152. All audio sources are fed to a routing matrix and made available for metering, embedding into the video outputs and external output and monitoring.



*The MV System Audio Concept*

**SMP-xx MultiViewer** - up to 4 audio input cards and up to 3 audio output cards

**MP-xx MultiViewer** – up to 8 audio input cards and up to 3 audio output cards

As well as embedding up to 8 audio channels (4 x Stereo pairs) into each of the video

## SIERRA VIDEO

output streams independently, a 6.35mm stereo phono socket is mounted on the front panel of the MultiViewer for local monitoring of two channels (Stereo pair) of audio. If external audio outputs are required, dedicated analog and digital audio cards are available handling balanced and un-balanced interfaces. Up to a maximum of 192 audio output channels are supported, either analog or digital or a combination of the two.

### Powerful Alarms

Alarms may be created for video sync loss, black (loss of luminance), freeze-frame, embedded audio loss, external audio loss, over level, out of phase (of chosen pairs), teletext loss, and closed caption loss.

The colors used for on-screen alarms are as follows:

- **Audio Loss: Yellow – position (left or right) indicates channel**
- **Audio Over: Red – position (left or right) indicates channel**
- **Anti-Phase: Cyan – middle alarm**
- **Carrier Loss: White – middle alarm**

If carrier loss occurs, only that alarm flashes, unless audio loss had already been active for the same channel.

The decoding of closed caption is available on each scaler, together with an associated alarm. WST and OP-47 teletext decoding is available for displaying.

On screen alarm indication may be a stationary or flashing colored tile border. External alarm indication may be via the GPI I/O or the LAN/software application.

Optional triggering of SNMP traps for each alarm function or group is also supported.

Tiles have an optional color coded border to provide status indication, such as tally or alarms.

VITC loss is indicated by the burnt in VITC display flashing. Burnt in VITC is available from SDI sources only.

### Captions and UMDs

Captions or Under Monitor Display (UMD) information may be generated manually from a keyboard connected to a front panel USB-2 port, or automatically from remote sources via the LAN, using browser software operating on a remote PC, or via the RS-232/422 port using TSL or other protocols. Up to two lines of UMD text can be left, centre, or right justified and may be placed anywhere in the tile.

### Using Bitmaps

There is storage capacity (approximately 200MB) for bitmaps. These can be used as backgrounds, or to display station idents, etc. The bitmaps must be in png file format and can be uploaded to the frame via the LAN.

## Keeping Time

Clock/date display data can be derived from several sources; the system clock, NTP synchronisation, LTC, or VITC from a chosen SDI input.

## Genlocking

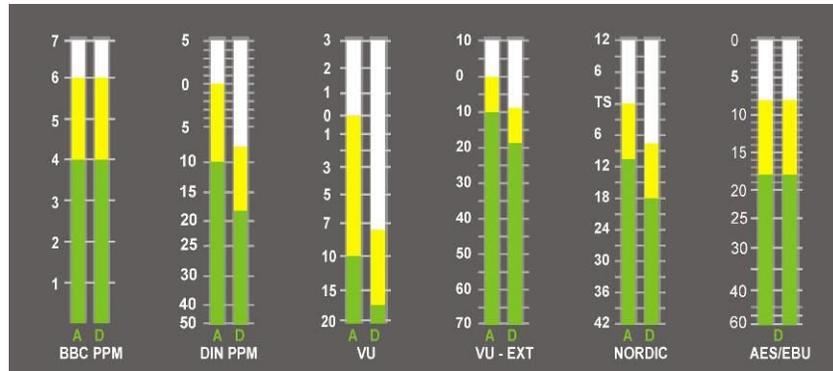
Genlocking of the MV is via SD color black or HD tri-level sync, using the genlock input.

## Using GPI I/O

Assignable GPI I/O with 8 inputs and 4 outputs are available for external alarm indication and tally functions. Extra GPI I/Os are available on most (but not all) Video input connector panel cards. Each Video input connector panel supporting GPI/O contains 8 GPI inputs and 4 GPI outputs.

## Bar Graph Scales

The following audio scales are supported:



*Available meter scales*

Colors used for the upper and lower ranges of each bar type can be customised to satisfy any in-house monitoring style for each of the six scale types.

## Thermal Shutdown

The SMP-xx/MP-xx frames have been load tested at worst case load and operating temperatures to ensure that the unit continues to function correctly under such conditions. In the unlikely event of a fault condition occurring that might result in the frame overheating, the following procedures are implemented to ensure that the unit does not overheat.

The MPX-NET network card can react with a series of initiated responses intended to reduce the temperature and then the power consumption of the rack considerably and so slow any abnormal internal temperature rise. These responses are triggered by a rise in the internal temperature of the rack and/or any detected fan failures.

## SIERRA VIDEO

The initial response of the MPX-NET card to an internal temperature rise above 35°C is to boost the drive to the fans in order to increase the airflow in the chassis. If the temperature detected in the immediate vicinity of the MPX-NET card continues to rise, the following temperature dependant thermal management actions are taken:

**Warning threshold 60°C** – When this threshold is reached, an on-screen warning message appears indicating the temperature and asking the user to check the ventilation of the rack is unobstructed.

**High power threshold 65°C** – If the detected temperature exceeds this threshold for more than a minute, the high power consumption hardware in the video input processing chain are put into reset mode. The on-screen message informs the user that this happened.

**Low power threshold 70°C** – Above this threshold the video output card is also held in reset. The on-screen display disappears as the video output is disabled.

If the detected temperature drops below the Warning threshold, all reset hardware is re-activated.

Similarly, if three or more fan failures are reported, on-screen and browser warning messages appear indicating the failure and the temperature threshold management actions are then implemented as necessary.

While the MV is in its thermal management state, the front red fan FF LED lights solid red, flashing red is used to indicate less severe conditions e.g. that at least one fan has failed.

Should the MPX-NET card fail to respond for any reason during a fault condition resulting in the unit overheating, the power supply (PSU) RCP-1000-24 has thermal shut down protection that is triggered under the following conditions:

75°C+/-5°C (TSW1) detect on heatsink of power transistor

85°C+/-5°C (TSW2) detect on heatsink of power diode

Under the above conditions the output voltage is shutdown. Recovery is automatic when the temperature drops.

## Features and Benefits Summary

- Modular MultiViewer family available in a choice of either 1RU (SMP-xx), or 3RU (MP-xx) chassis.
- SMP-xx MultiViewer has a maximum capacity of 16 Video input channels when used as a single MultiViewer instance or it can be configured to support two independent MultiViewers within the same chassis.
- MP-xx MultiViewer has a maximum capacity of 72 Video input channels when used as a single MultiViewer instance or it can be configured to support up to 9 independent MultiViewers within the same chassis.
- Two independently configurable HDMI outputs each with parallel HD-SDI outputs per MultiViewer instance.
- Dedicated analog and digital audio input/output cards available.
- Optional SMP-Rxx MultiViewer frame offering independent 16x16 HD-SDI (up to 3G) routing ability.
- Genlocked inputs for flicker-free and full frame operation.
- Teletext subtitles display (WST on SD-SDI or OP-47 on HD-SDI).
- AFD decoding for adjusting aspect ratio.
- D-VITC and ancillary time code decoding and display (SDI/HD-SDI sources only).
- Audio metering is supported for up to 32 meter bars per video tile (up to 16 channels of embedded audio + external audio sources).
- Audio metering may be sourced from SDI / HD-SDI embedded audio groups (PCM or Dolby E metadata meter segment), HDMI embedded audio, or externally via optional analog and AES/EBU (with SRC) interfaces.
- Front panel mounted 6.35mm stereo phono socket for use as an assignable analog audio monitor output (One stereo pair).
- Front panel mounted OLED display offering chassis and card status updates
- Alarms for video, audio and metadata, with outputs to, GPI O/Ps, LAN and/or SNMP traps.
- Input standard decode available as on-screen caption.
- Assignable tallies.
- Under Monitor Displays (UMD) entered via keyboard, LAN or serial cable, supporting TSL and other protocols.
- Clock display receiving time information via NTP network protocol, LTC or VITC.
- SMP-xx and MP-xx lightweight compact designs are both ideal for OB-vans and other space restricted installations.
- Intelligent fan speed control.
- Optional external backup power supply (Power-xx).
- User-friendly set-up via browser software.

# Installation

## Introduction

Installation procedures are similar for all frames covered under this manual. Exceptions, if any, have been noted in each of the following paragraphs.



- Refer to the Safety section before connecting power to the unit and **check all cards and the power supply are correctly seated in the chassis** before initial power up.
- The installation and maintenance of the MultiViewer and any associated equipment must be carried out by persons suitably qualified to work with equipment which may be connected to the mains.
- The mounting and installation of this equipment must be arranged by the user to comply with all current local safety regulations.

## Ventilation

Ventilation is assisted by cooling fans located on the removable front panel of both frames.

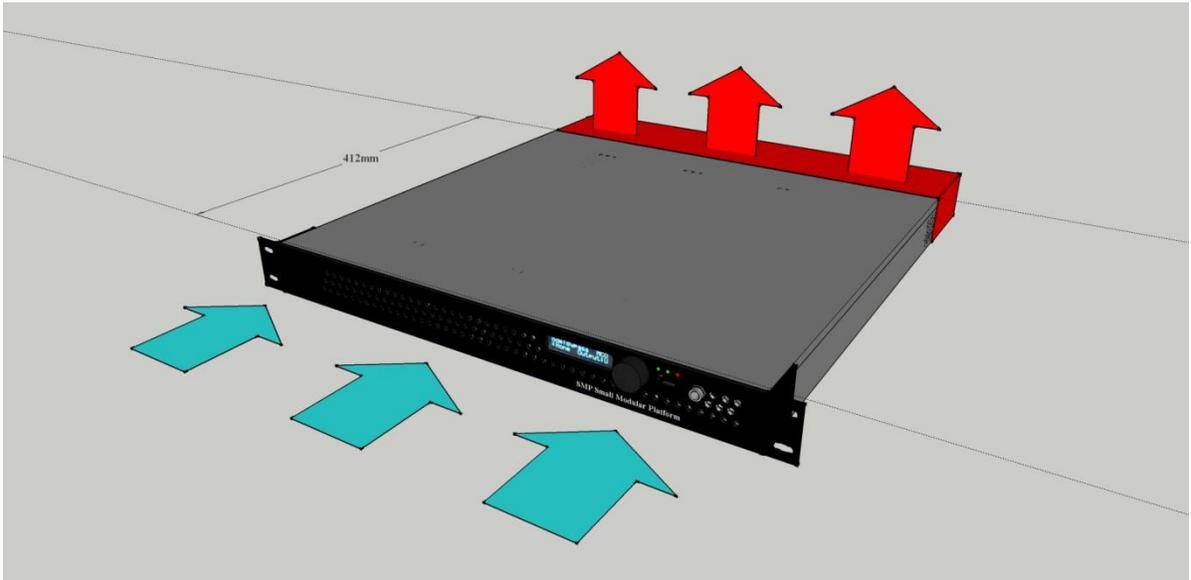


- The maximum ambient operating temperature must be less than 40°C.
- The inlet and outlet vents should be periodically cleaned and kept free from the build-up of dust.
- To maintain adequate cooling, a frame must not be run for more than two minutes with the front panel open.
- For ventilation purposes, there must be a gap of at least 50mm (2 inches) for the front inlet and connector panel outlet grilles.

Air is pulled through the ventilation inlets in the front panels, circulated through the MultiViewer and expelled through the connector panel ventilation outlets as shown in the following images.

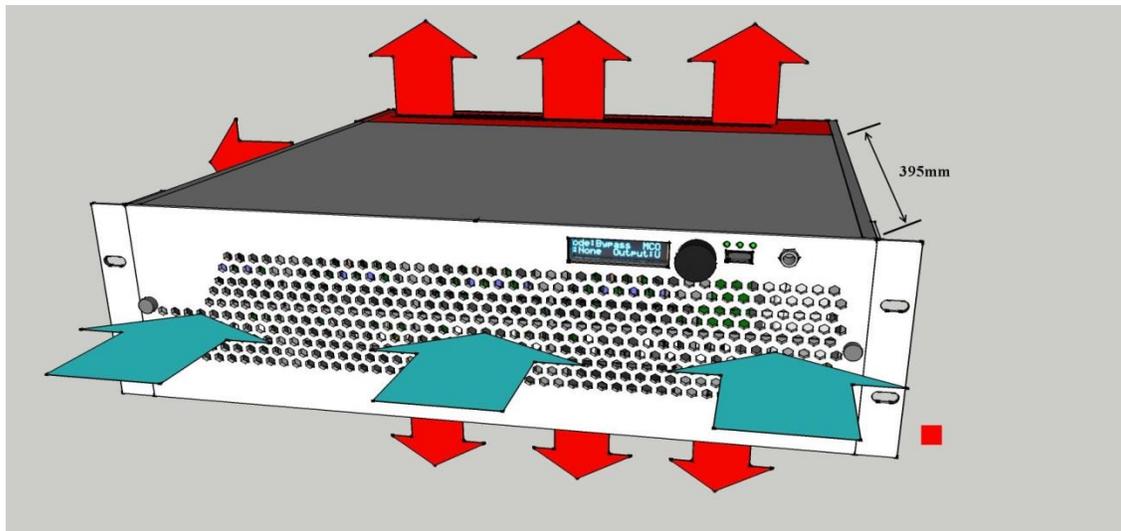
**SIERRA VIDEO**

**SMP-xx MultiViewer** – This chassis has a depth of approximately 511mm, including connectors. Exhaust grilles are located on the upper and side panels, at a depth of approximately 412mm from the front panel.



*SMP-xx MultiViewer frame showing ventilation airflow*

**MP-xx MultiViewer** – This chassis has a depth of approximately 455mm, including connectors. Exhaust grilles are located on the upper, lower and left-hand side panels, at a depth of approximately 395mm from the front panel



*The MP-xx MultiViewer frame showing ventilation airflow*

## Rack Mounting

The 1RU SMP-xx and 3RU MP-xx MultiViewers can be installed in 19" bays but they **MUST** be placed on a suitably specified and installed rack shelf and secured to the rack using the front ears with the correct rack mount screws or bolts.



- Do not rack mount the MultiViewers using only the front rack ears.
- If installing equipment immediately above or below the MultiViewer it is essential to ensure that the ventilation outlets are not obstructed (see previous Ventilation section).
- For ventilation purposes, there must be a gap of at least 50mm (2 inches) for the front inlet and connector panel outlet grilles.
- You must allow at least 100mm (4 inches) of space at the connector panel of the MultiViewer for cables and connections.

## Power and Fuses

The SMP-xx and MP-xx chassis have one IEC power inlet each and the mains voltage (240/100 volts) is auto-detected provided it is in the range 100-240V AC 50/60Hz.

**SMP-xx MultiViewer** – A **3.15A** fuse and spare are located under the pull-out flap.

**MP-xx MultiViewer** – An **8A** fuse and spare are located under the pull-out flap.



- The IEC power inlet is the mains disconnection device for these units.
- For UK only use, a mains cable with a minimum rating of 10A, fitted with a 10A fuse is recommended.
- This equipment can have more than one power supply source fitted, AC mains and/or a 24V DC back-up (Via the optional **Power-xx**). To reduce the risk of electrical shock, disconnect **ALL** the power cords before servicing.
- Electric shock hazards exist if conductive instruments, neck chains or fingers etc. are placed within the unit or in close proximity of the input/output terminals connectors.

**SMP-xx MultiViewer** - This product has no disconnect device, isolation from the mains is achieved by completely removing the mains plug from the IEC inlet



*SMP-xx MV AC mains and external DC inputs*

## SIERRA VIDEO

**Note:** A **3.15A** fuse and spare are located under the pull-out flap immediately under the connector pins. Only the **LIVE** conductor is fused and is the **LEFT** hand fuse. The **right** hand fuse is the **spare** and can be removed and placed into the left hand slot when required. See the **Problem Solving** section for more details.

Additional spare fuses should be to the following specification:

3.15A Fuse 5x20mm, Time-delay. (e.g. Bussmann S505-3.15-R)

**Note:** Next to the AC input on each SMP-xx MV can be seen a high-power 2-pole D-type. This is used in conjunction with the optional external backup power supply POWER-xx (see **Backup Power Supply** section for more detail).

**MP-xx MultiViewer** - This product has no disconnect device, isolation from the mains is achieved by completely removing the mains plug from the IEC inlet



*MP-xx MV chassis AC mains and external DC inputs*

## SIERRA VIDEO

**Note:** An **8A** fuse and spare are located under the pull-out flap immediately to the right of the connector pins. Only the **LIVE** conductor is fused and is the **BOTTOM** fuse. The **top** fuse is the **spare** and can be removed and placed into the bottom slot when required. See the **Problem solving** Section for more details.

Additional spare fuses should be to the following specification:

8A Fuse 5x20mm, Anti-surge/Time delay (e.g. Schurter 0001.2513)

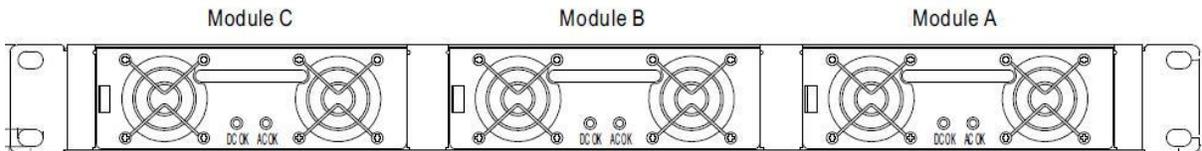
**Note:** Above the AC input on each MP-xx MV can be seen a high-power 2-pole D-type, this is used in conjunction with the optional external backup power supply POWER-xx (see **Backup Power Supply** section for more detail).

### Back Up Power Supply

Above the IEC mains inlet on the SMP-xx/MP-xx frames is a 2way D-type that accepts 24V DC from the optional 1RU external back-up power supply unit 'POWER-xx'. The POWER-xx may be installed in 19" bays and has a depth of approximately 380mm, including connectors. It is designed to be located close to the MV frame and is supplied with the necessary interconnecting DC cable.

Up to three supplies can be fitted into the POWER-xx, to provide additional redundancy within the Power-xx. Only one module is fitted as standard in the 'Module B' slot. In the event of failure of the internal MV power supply, POWER-xx provides a back-up feed without interruption.

DO NOT use any other 24V DC sources or interconnecting cables other than the POWER-xx and supplied cable.



*The 1RU POWER-xx Backup Power Supply*

**Note:** ONLY one Power-xx frame should be used for each MultiViewer because:

1. Depending on the MV loading - the DC current could exceed the rated capacity of the cable or the connectors.
2. There is only 1 DC connector on the connector panel of the Power-xx so it would be physically difficult to try and attach more than 1 set of MV connections and cables.

# Configuration

## Connector I/O

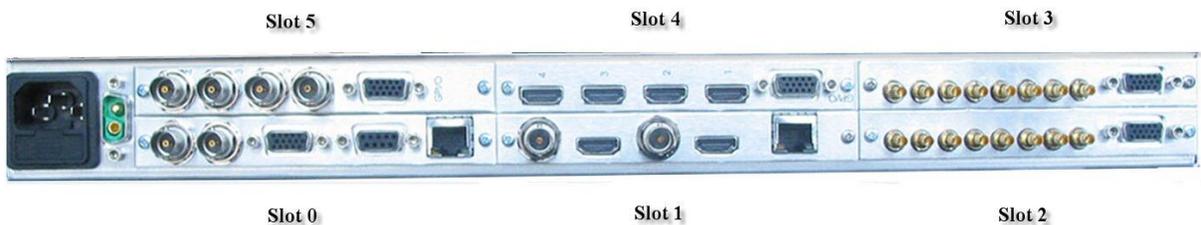
The SMP-xx and MP-xx MultiViewers support the same connector panels and main cards and the configuration rules for populating the two frames are exactly the same. A MultiViewer must comprise a MPX-MVC output card and at least one VIP video processing card. Where multiple MultiViewers are configured in a single chassis, each MultiViewer instance must also comprise of an MPX-MVC output card and at least one VIP video processing card.

Dedicated audio input and output cards may also be added for additional audio support.

## SMP-xx MultiViewer

This has six connector panel slot locations. Slot 0 is reserved for the RMP-NET network connector panel in all applications and any other MV compatible connector panel does not locate correctly into this slot location (see **Appendix A** for the connector panel PCB profiles). Likewise, the RMP-NET connector panel cannot be inserted into any other slot location.

For all single or dual MultiViewer applications, slots 1-5 must then be populated from Slot 1 onwards with no gaps. Blanking plates are available to cover unused slot locations.



*SMP-xx MV connector panel slot locations*

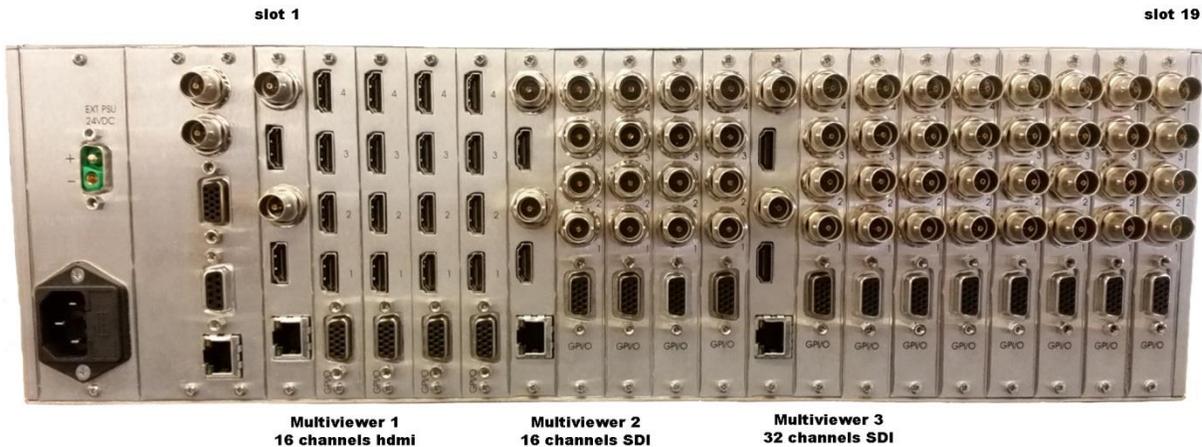
## SIERRA VIDEO

**Note:** Any main card slot that is occupied must have a compatible connector panel fitted in the corresponding connector panel slot. However, in the case of the router equipped SMP-Rxx MultiViewer, due to the nature of the router-based inputs to the video cards, connector panels can be fitted into slots where there is no corresponding main card fitted. This allows additional inputs to be used by the MultiViewer without the overhead of an additional video processing card if it is not required.

## MP-xx MultiViewer

In addition to the AC/DC power input connector panel, the MP-xx has twenty connector panel slot locations. Slot 0 is reserved for the RMP-NET connector panel in all applications and any other MV compatible connector panel does not locate correctly into this Slot location (see **Appendix A** for the connector panel PCB profiles). Likewise, the RMP-NET connector panel cannot be inserted into any other Slot location.

For all single or multiple MultiViewer applications, Slots 1-19 must then be populated from Slot 1 onwards with no gaps. Blanking plates are available to cover unused slot locations.



*MP-xx connector panel slot locations. This shows an example of three MultiViewer instances supported in a single chassis*

**Note:** Any main card slot that is occupied must have a compatible connector panel fitted in the corresponding connector panel slot

## Connector Panel Modules

See the **Summary of connector panel modules** table at the end of this chapter for a concise list of all available connector panels and their capabilities.

See **Appendix H** for details on how to use the MV web browser interface (GUI) in order to remotely identify any connector panels fitted in a live chassis.

### Standard Connector Panels

**RMP-NET (network) connector panel** – This is the only connector panel that has a different mechanical format between the 1RU and 3RU Frames. The signal connectivity is identical, the only difference is the 3RU version has a wider connector panel plate. All other MV connector panels are identical in form and functionality and can be used in either sized frame.

**SMP-xx 1RU MultiViewer** – Looking from left to right, the NET connector panel uses coaxial BNC connectors for reference and timecode inputs. The global GPI I/O connector is a high density 15-pin HD (F) connector and the serial port is a 9-pin D-sub (F) connector. A standard RJ-45 connector is provided as an auxiliary LAN connection (N.B MultiViewer browser control is via the **RMP-MVC** LAN port).

**REF TIME CODE GPI/O RS-422 LAN**



*SMP-xx MultiViewer RMP-NET connector panel connections*

**MP-xx 3RU MultiViewer** – As can be seen from the following image, the connectivity of the 3RU RMP-NET connector panel is identical to the 1RU version, the connector panel metalwork is just wider.

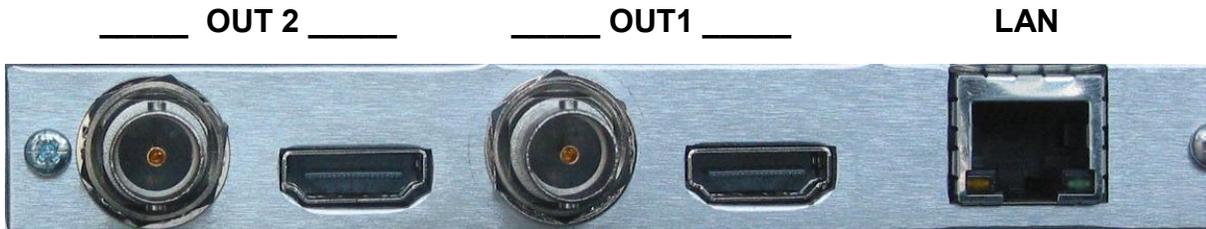


*MP-xx MultiViewer RMP-NET connector panel connections*

**Note:** There is a USB connector on the front panel for keyboard connection and auxiliary functions.

## SIERRA VIDEO

**RMP-MVC connector panel** - The main MV video and audio outputs are usually (see **RMP-DVI** for alternative video out connector panel) provided via the MVC connector panel fitted with two Type A HDMI connectors and two coaxial BNC connectors. **Two independent video outputs are provided via each HDMI connector**, each of which is paired with a BNC providing a slaved HD-SDI output with embedded audio. A standard RJ-45 connector is provided as a LAN connection from which the MultiViewer browser control application is accessed.



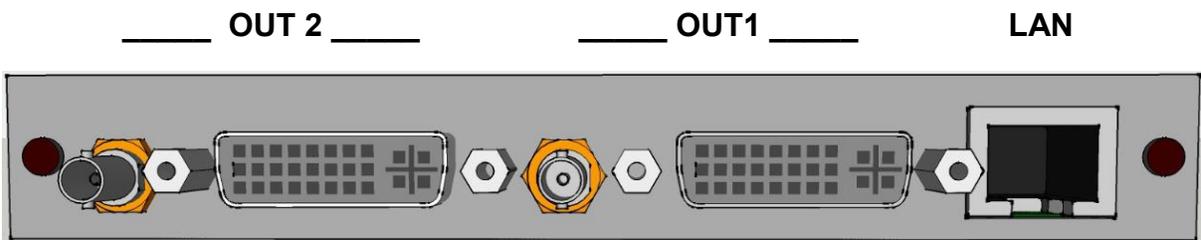
*RMP-MVC connector panel connections*

**Note:** See **Appendix F** regarding the MV **HDMI cable retention** capability for safely securing HDMI cables against accidental removal.

**RMP-DVI-xxxx connector panel** – Where video outputs via DVI connectors are required, the DVI connector panel offers the same functionality as the RMP-MVC connector panel, but is fitted with two DVI connectors supporting DVI-D single link in place of the two HDMI connectors. A slaved coaxial SDI output is also provided, but due to space constraints this is via two miniature coaxial outputs. The MultiViewer browser control application is still accessed via the LAN port.

Options: **RMP-DVI-MBNC** (2x micro (HD)-BNC fitted)

**RMP-DVI-1023** (2x 1.0/2.3 coaxial connectors fitted)



*RMP-DVI-1023 connector panel connections*

## SIERRA VIDEO

**Video Input connector panels** – Video input connector panels are offered in two different styles; those using traditional BNC connectors for HD-SDI and analog video inputs, and those using miniature coaxial connectors where increased functionality or space constraints dictate a higher connector density.

**Note:** On certain connector panels, a high density 15-pin HD (F) connector is fitted providing a GPI/O interface (8 inputs/4 outputs).

**RMP-SD4 connector panel** – One of the most popular connector panels, the RMP-SD4 is equipped with four BNC connectors each of which is capable of accepting up to 3G SDI inputs. Up to 2 of these inputs can also be used for composite video by utilizing the two A-D decoders on the Video processing card. A 15 way D-type connector for GPI/O connectivity is also fitted.



*RMP-SD4 connector panel with 4x 3G video inputs and 15 way GPI/O*

**RMP-HM4 connector panel** – Where source equipment is fitted with HDMI outputs, the RMP-HM4 offers four Type A HDMI inputs along with a 15 way GPI/O connector.



*RMP-HM4 connector panel with 4x HDMI video inputs and 15 way GPI/O*

**Note:** See **Appendix F** regarding the MV **HDMI cable retention** capability for safely securing HDMI cables against accidental removal.

## SIERRA VIDEO

**RMP-CV4 connector panel** - Where the ability to handle a mixture of SDI and composite inputs is required, the RMP-CV4 connector panel can be utilised offering a combination of up to four 3G SDI or composite inputs via BNC connectors.

SDI4/    SDI3/    SDI2/    SDI1/  
CVBS4   CVBS3   CVBS2   CVBS1



*RMP-CV4 connector panel with 4x 3G SDI/composite video inputs*

**RMP-CCTV connector panel** - The CCTV connector panel is similar to the RMP-CV4 connector panel, however it offers four composite only inputs and has **NO** SDI capability. It is optimised for CCTV applications where analog feeds are still common and often the pictures can be low frame rate but require viewing in as high a quality as possible. The RMP-CCTV connector panel offers exceptional quality processing specifically for composite video signals in such applications.

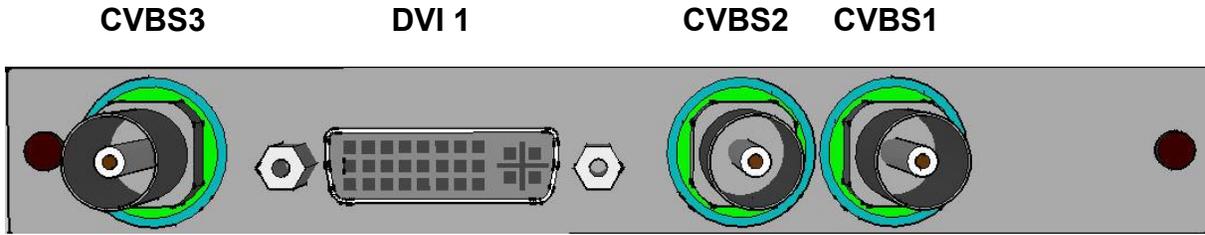
CVBS4    CVBS3    CVBS2    CVBS1



*RMP-CCTV connector panel with 4x composite video inputs*

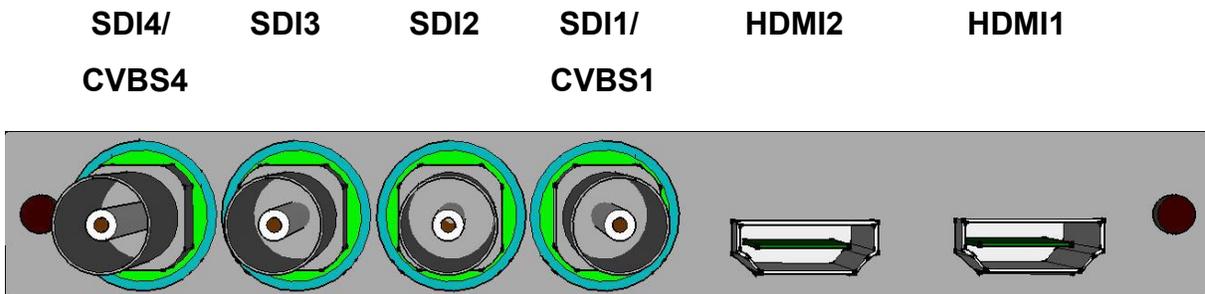
**RMP-RC3 connector panel** - With three composite only BNC inputs, the RC3 is similar to the CCTV connector panel but offers the additional flexibility of a DVI-D input for mixed signal applications.

**SIERRA VIDEO**



*RMP-RC3 connector panel with 3x composite video inputs and a DVI-D input*

**RMP-H64 connector panel** - For mixed input signal flexibility, the H64 connector panel offers the user the ability to choose **four from the six inputs** for video processing. All four BNC inputs can accept up to 3G SDI inputs, with two also capable of handling composite signals. Two HDMI inputs are also provided allowing a wide range of input signals to be accepted.



*RMP-H64 connector panel with 4x 3G SDI (2x composite capable) and 2x HDMI video inputs*

**Note:** Only four inputs from the possible six can be processed at any one time when using the RMP-H64 connector panel.

See **Appendix F** regarding the MV **HDMI cable retention** capability for safely securing HDMI cables against accidental removal.

## High Density Connector Panels

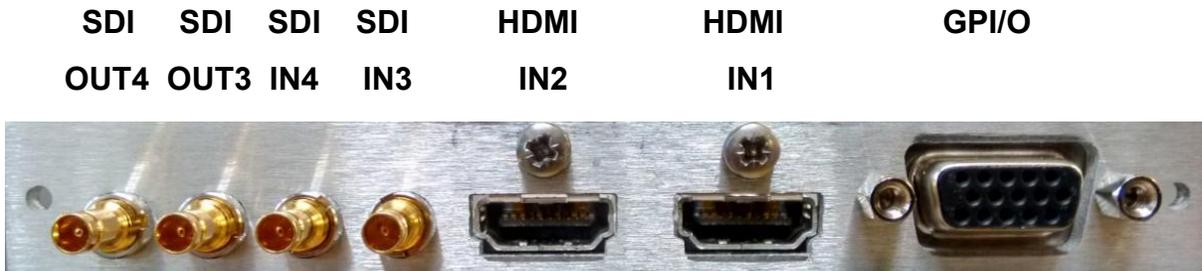
To allow for a higher connector density offering additional functionality, the following connector panels are available fitted with either micro (HD)-BNC (**-MBNC**) or 1.0/2.3 (**-1023**) miniature coaxial connectors.

**RMP-HM2-xxxx connector panel** – For input signal flexibility where space is a premium, the HM2 connector panel offers a combination of two 3G SDI miniature coaxial inputs, two HDMI inputs and two 3G SDI miniature coaxial outputs (for use with the SMP-Rxx only). It can be used with the non-router **SMP-xx** or the router based **SMP-Rxx** or indeed the **MP-xx**.

When used with the SMP-Rxx, the two additional miniature coaxial SDI outputs become operational and can be assigned to output any combination of the two SDI inputs using the router menu in the browser (see the **16x16 SDI I/O Router Menu** section in Chapter 4 of the manual).

Options: **RMP-HM2-MBNC** (4x micro (HD)-BNC fitted)

**RMP-HM2-1023** (4x 1.0/2.3 coaxial connectors fitted)



**RMP-HM2-1023** connector panel with 2x 3G SDI and 2x HDMI video inputs and 15way GPI/O  
(The 2x 3G SDI outputs are also available if used with in the **SMP-Rxx** frame)

**Note:** The internal SDI signal routing of the HM2 connector panel has identical paths to those in the **RMP-SR4** router connector panel. Hence the SDI IN and OUT labels have been numbered to tie up with their counterparts in the SR4 connector panel (rather than 1 and 2) and so appear, and are controlled, in an identical fashion in the router matrix of the browser software.

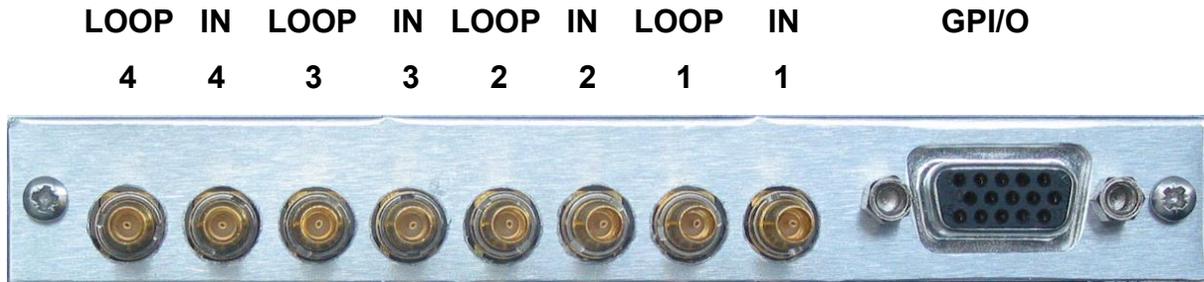
**Note:** See **Appendix F** regarding the MV **HDMI cable retention** capability for safely securing HDMI cables against accidental removal.

**SIERRA VIDEO**

**RMP-SL4-xxxx connector panel** – Utilising eight miniature coaxial connectors, this connector panel has a loop-through output on each of its four video inputs in order to ease connectivity issues where space is at a premium.

Options: **RMP-SL4-MBNC** (8x micro (HD)-BNC fitted)

**RMP-SL4-1023** (8x 1.0/2.3 coaxial connectors fitted)



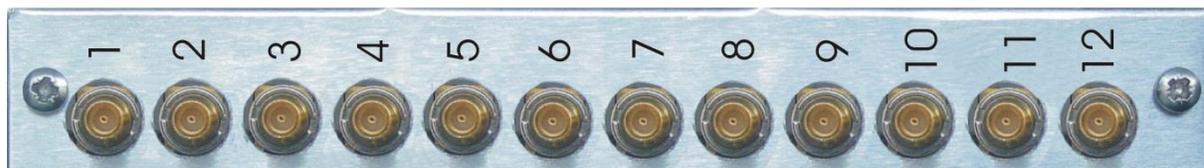
***RMP-SL4-1023** connector panel with 4x 3G SDI video inputs with loop-through and 15 way GPI/O*

**RMP-AN4-xxxx connector panel** – As well as accepting up to two 3G SDI inputs, this connector panel allows the input of up to two of the following analog inputs via twelve miniature coaxial connectors:

- composite video
- Y/C Video
- YUV (525/625 lines Interlaced Component Video)
- RGsB (525/625 lines video)
- RGBHV (525/625 lines video level).

Options: **RMP-AN4-MBNC** (12x micro (HD)-BNC fitted)

**RMP-AN4-1023** (12x 1.0/2.3 coaxial connectors fitted)



***RMP-AN4-MBNC** connector panel with up to four analog video inputs  
or up to 2x 3G SDI with 2x analog video inputs*

## SIERRA VIDEO

See the following table for details of the connection configuration options with this connector panel module.

Connector number	Signal connection type	Connector number	Signal connection type
1	CVBS2 / Luma / Green 2	7	<b>SDI1</b>
2	CB / Chroma / Blue 2	8	CVBS1 / Luma / Green 1
3	CR / Red 2	9	CB / Chroma / Blue 1
4	HSync 2	10	CR / Red 1
5	VSync 2	11	HSync 1
6	<b>SDI2</b>	12	VSync 1

## Audio Connector Panel

**RMP-A32 connector panel** – This connector panel is used with any of the range of Digital or Analog Audio input or output cards for this range. It is fitted with two high density 44 way female ‘D’ connectors supporting a total of 32 audio input channels (16 inputs/connector). With the appropriate interface cable and related audio input/output card, the audio connector panel is capable of accepting analog or digital audio signals.

**Audio inputs: 1-16**

**Audio inputs: 17-32**



*RMP-A32 with 2x 16 audio input/output connectors*

## Input/Output Card Configurations

Paired to the connector panel locations in each MV chassis, there are an equal number of main card slots accessed by detaching the front panel from its guide rails. Slot 0 is reserved for the MPX-NET network card in all applications and any other MV compatible main card does **NOT** physically fit into this location (see **Appendix A** for main card PCB profiles). Similarly, the MPX-NET main card cannot be inserted into any other main card locations.

For typical MultiViewer applications, Slot 1 must be occupied by the MPX-MVC card. The remaining slots are used for the video processing cards. The only exception to this occurs when audio outputs are required. Audio output cards are always located downstream of the MVC card. In this case, up to **three** audio output (AOPxxA/D) cards may be located in the three slots immediately **before** the MPX-MVC video output card. Any subsequent video processing (VIP) or audio input (AIPxxA/D) cards are then placed **after** the MVC card.

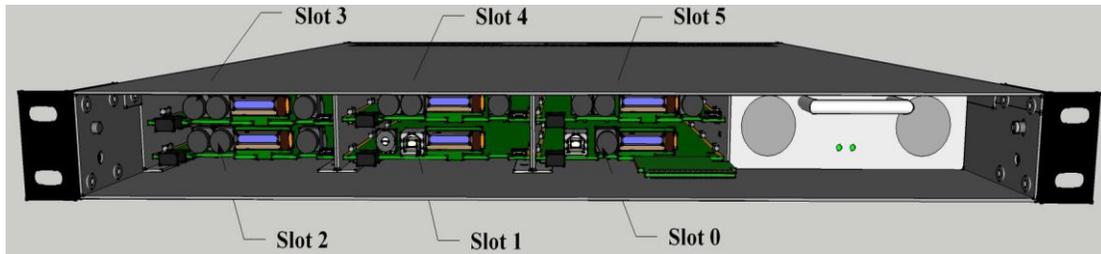
If it is necessary to support multiple independent MultiViewers within a single chassis, they can be supported by inserting one MVC output card and at least one VIP video card per MultiViewer instance.

---

**Note:**

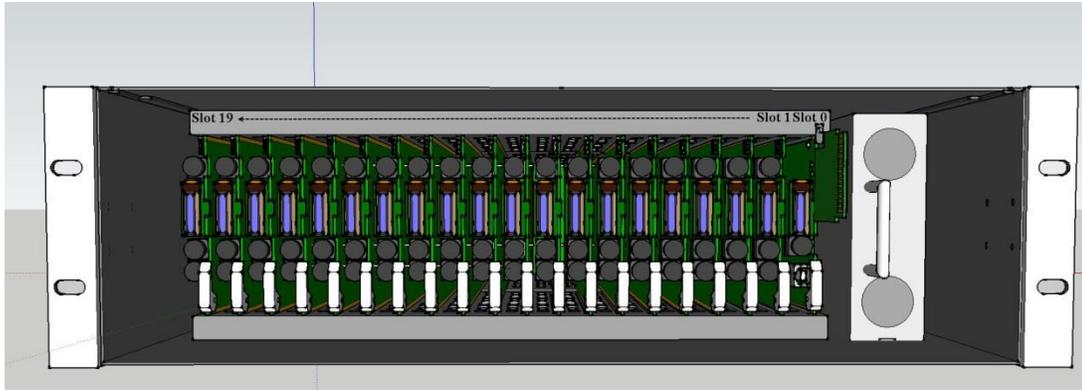
See the **Configuration rules** in the **Hardware Configuration** section towards the end of this chapter for further information on how to correctly install the various MultiViewer video and audio card options.

The main card slot locations in the 1RU and 3RU MultiViewer chassis are shown in the following images, with the MPX-NET network card shown in Slot 0.



*SMP-xx Main card slot locations with the MPX-NET card shown in Slot 0*

## SIERRA VIDEO



*MP-xx Main card slot locations with the MPX-NET card shown in Slot 0*

**Note:** I/O cards are hot-swappable and so it is not necessary to power down the chassis in order to remove or insert new cards. The firmware automatically detects new cards and configures them appropriately.

### Video Inputs

As described in the **Connector I/O** section, separate connector panel connector modules of the required type are fitted to allow interfacing with each input card. These are available with different combinations of BNC, mini-coaxial and HDMI connectors to cover most applications. A single BNC connector is normally used for digital video standards SD-SDI, HD-SDI and 3G-SDI or for analog composite video.

For operations requiring the ability to process more traditional analog video inputs, such as RGBHV/YUV, a specific analog/digital video input connector panel (**RMP-AN4**) is available making use of mini-coaxial interconnects to offer a high connector density.

Some video input card connector modules are also equipped with a GPI/O (8x In, 4x Out) port where space is available.

The VIP3 video card provides 4 video inputs. With the appropriate connector panels fitted, the combinations of video input types supported are:

- 4x SD/HD-SDI up to SMPTE 424M (3G)
- 4x any combination from 4x 3G SDI and 2x composite video
- 4x any combination from 4x 3G SDI and 4x composite video
- 4x any combination from 2x 3G SDI and 2x HDMI
- 4x composite video
- 4x any combination from 2x SDI plus; 2x composite or, 2x analog component (YUV) or 2 x RGBHV (525/625 lines video level)
- 4x HDMI up to 1920x1200 @ 60Hz

## Video Outputs

Each **RMP-MVC** connector panel has two HDMI display outputs (Each with an associated Parallel HD-SDI BNC output) that support resolutions up to 1080p60, 16:9 (1920 x 1080). Tiles displayed via the outputs can be varied continuously in size and position, cropped or displayed in pre-configured screen layouts on a chosen colored background. The pair of outputs may either be set to provide two identical display configurations, or they may have differing arrangements.

**Note:** The **RMP-DVI** connector panel offers two DVI outputs instead of the two HDMI outputs of the RMP-MVC connector panel. The parallel HD-SDI outputs are also still supported on this connector panel but instead are presented on miniature coaxial connectors due to the space restrictions.

## Audio Inputs

Audio levels may be displayed using up to 16 bargraphs in each tile, either superimposed on each video image or outside active video. Audio data can be extracted from all incoming embedded audio (when using SDI or HDMI inputs).

External audio can also be input to the MultiViewer using specific audio input cards available in three formats:

- **AIPxxA** analog only audio input cards (up to 32 channels)
- **AIPxxD** digital only audio input cards (up to 32 AES/EBU pairs) with sample rate conversion for maximum flexibility
- **AIP32AD** analog and digital audio input cards (up to 32 channels of either AES/EBU pairs or analog)

Multiple instances of these audio input cards may be installed, but see the **Configuration rules**, in the Hardware Configuration section at the end of this chapter, for the optimum placement of **audio input cards** in the MultiViewer chain.

To allow for maximum system flexibility, the analog and digital audio input cards are available in the following input configurations:

Analog audio input card	Max. no. of channels supported	Digital audio input card	Max. no. of AES pairs supported ( <i>Channels</i> )
<b>AIP08A</b>	8	<b>AIP08D</b>	8 (16)
<b>AIP16A</b>	16	<b>AIP16D</b>	16(32)
<b>AIP32A</b>	32	<b>AIP32D</b>	32(64)
An <b>AIP32AD</b> card is also available supporting a user selectable mixture of analog and digital audio inputs up to a maximum of 32 channels/AES pairs.			

---

**Note:** Digital audio cards have twice the effective channel capacity of analog cards because digital audio is transmitted as AES pairs comprising two discreet channels (though these are often just the left and right stereo components).

See **Appendix E** for an explanation of how to set the audio input cards up where options are available for analog/digital selection and balanced/un-balanced input terminations (model dependent).

Note: All bargraph scales and ballistics conform to international standards and include BBC PPM, DIN PPM, Nordic PPM, VU, extended VU, and AES/EBU digital.

---

**Note:** See **Appendix B** for an explanation on the audio channel numbering convention adopted when using multiple audio cards.

See **Appendix C** for details on the use of audio I/O cards in the SMP-Rxx MultiViewer frame fitted with the optional router capability.

### Audio Outputs

A number of options are available for monitoring all incoming audio streams:

- A front panel mounted 6.35mm phono socket allows two channels of selected audio to be monitored through stereo headphones. Channel selection can be via the web browser interface or by using the front panel mounted OLED display and selection knob.

---

**Note:** The phono socket is **only** driven by the MPX-MVC card that is closest to the MPX-NET card in slot 0. Where there are MPX-MVC cards in other slots (as would be the case when multiple independent MultiViewer instances are being supported in a single chassis), the option for outputting audio monitor pairs is still available, but they **won't** be routed to the front panel mounted phono socket.

- Up to 8 channels (4 stereo pairs) of Embedded audio can be embedded onto each HDMI/SDI output pair on the RMP-MVC connector panel module. These 4 stereo pairs can be selected independently per output pair on the RMP-MVC. The embedded audio can be monitored via a suitable display or by using a suitable audio de-embedder.
- External audio outputs are also possible by installing specific audio output cards available in two formats:
  - **AOPxxA** - Analog audio output card capable of supporting up to 32 analog channels.
  - **AOPxxD** - Digital output card that can support up to 32 AES/EBU pairs.

## SIERRA VIDEO

To allow for maximum system flexibility, the analog and digital audio output cards are available in the following output configurations:

Analog audio output card	Max. no. of channels supported	Digital audio output card	Max. no. of AES pairs supported ( <i>Channels</i> )
<b>AOP08A</b>	8	<b>AOP08D</b>	8 (16)
<b>AOP16A</b>	16	<b>AOP16D</b>	16(32)
<b>AOP32A</b>	32	<b>AOP32D</b>	32(64)

**Note:** Digital audio cards have twice the effective channel capacity of analog cards because digital audio is transmitted as AES pairs comprising two discrete channels (though these are often just the left and right stereo components).

See **Appendix E** for an explanation of how to set the digital audio output cards up for balanced/un-balanced output terminations.

**Note:** The total number of external audio outputs supported per MultiViewer instance is 96 analog channels or 96 AES pairs. Combinations of analog and digital outputs can be 32 analog channels / 64 AES pairs or 64 analog channels / 32 AES pairs. If an analog/AES combination is required then both AOPxxA and AOPxxD cards must be fitted.

The only valid placement combinations of the audio output cards (in any order, immediately to the left of the MPX-MVC card, as viewed from the connector panel) are:

- **1 x AOP32A cards** – for 32 analog output channels
- **2 x AOP32A cards** – for 64 analog output channels
- **3 x AOP32A cards** – for 96 analog output channels
- **1 x AOP32D card** – for 32 AES outputs (64 audio channels)
- **2 x AOP32D card** – for 64 AES outputs (128 audio channels)
- **3 x AOP32D card** – for 96 AES outputs (192 audio channels)
- **1 x AOP32A + 1 x AOP32D card** – for 32 analog and 32 AES outputs
- **1 x AOP32A + 2 x AOP32D card** – for 32 analog and 64 AES outputs
- **2 x AOP32A + 1 x AOP32D card** – for 64 analog and 32 AES outputs

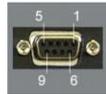
See the **Configuration rules**, in the Hardware Configuration section at the end of this chapter, for the optimum placement of **audio output cards** in the MultiViewer chain.

**Note:** Dolby E cannot be decoded and monitored. The optional VIP-3D scaler card allows for metering **but not decoding** of Dolby E metadata. The sources of audio that can be monitored are non-Dolby SDI embedded in, HDMI embedded in, and PCM or analog audio in from the AIPxxA/D audio input cards.

## Serial Port Assignments

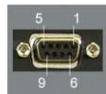
There is a single serial data port on the RMP-NET connector panel that can be configured for either RS-232 or RS-422 operation. The mode of operation is set by means of jumpers CN8, CN9 and CN10 on the MPX-NET network card.

Female 9 way 'D' connector RS-422 assignments



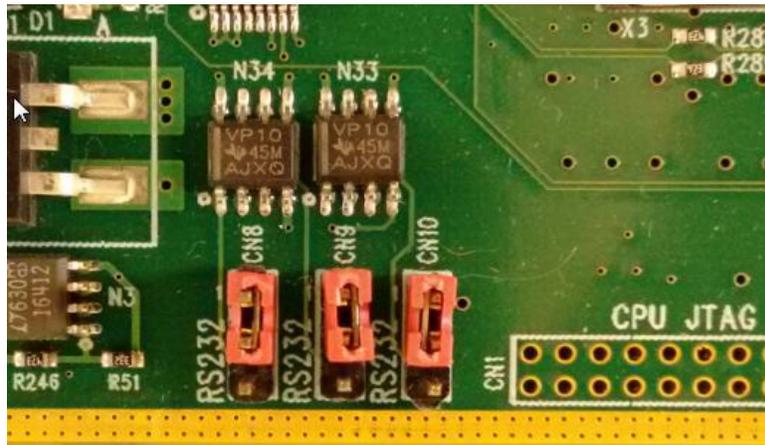
Pin No	Function
1	GND
2	RX -
3	TX -
7	RX+
8	TX+

Female 9 way 'D' connector RS-232 assignments



Pin No	Function
2	TX
3	RX
5	GND

Access to change the jumper settings, requires the removal of the MPX-NET card from the front of the unit with the power removed.



MPX-NET network card showing jumper pins CN8-10 (all set to RS-232 in this image)

CN8 (pair) – Position 1/2 RS-232. Position 2/3 RS-422.

CN9 (pair) – Position 1/2 RS-232. Position 2/3 RS-422.

CN10 (pair) – Position 1/2 RS-232. Position 2/3 RS-422.

**Note:**

Pin 1 is the top-most pin for each of the three jumpers shown. The RS-232 markings printed on the PCB are there purely to highlight that these are the jumpers for the RS-232/RS-422 settings. Use the pin settings shown to set the appropriate terminations.

## Global Pin Assignments

Global (via RMP-NET network connector panel) and VIP video input card GPI I/O pin assignments

15-pin HD (F) connector assignments

Pin No	Function
1	GPI In 1
2	GPI In 2
3	GPI In 3
4	GPI In 4
5	GND
6	GPI In 5
7	GPI In 6
8	GPI In 7
9	GPI In 8
10	GND
11	GPI Out 1
12	GPI Out 2
13	GPI Out 3
14	GPI Out 4
15	GND

**Note:**

The method of activating GPI inputs (where fitted) varies depending on the type of connector panel card:

**Type 1:** All connector panels other than those listed under '**Type 2**' simply require a GPI input pin to be shorted to the GND pin on the GPI connector to trigger it.

**Type 2:** The RMP-SD4 and RMP-HM4 (and some legacy connector panels) require the GPI input pin to have an external voltage in the range of 3V to 9V connected momentarily to trigger it. e.g. The external voltage source's negative terminal is connected to the GND pin of the GPI connector; the positive terminal is connected to a GPI input pin via a switch.

## Audio I/O Connector Panel Connector Pin Assignments

44-pin 'D' connector (F) audio I/O assignments channels 1 – 16

Analog or Digital In/Out	+VE	-VE	GNDs
Ch 1/AES 1	15	30	
Ch 2/AES 2	14	29	
Ch 3/AES 3	13	28	
Ch 4/AES 4	12	27	
Ch 5/AES 5	11	26	
Ch 6/AES 6	10	25	
Ch 7/AES 7	9	24	
Ch 8/AES 8	8	23	
Ch 9/AES 9	7	22	
Ch 10/AES 10	6	21	
Ch 11/AES 11	5	20	
Ch 12/AES 12	4	19	
Ch 13/AES 13	3	18	
Ch 14/AES 14	2	17	
Ch 15/AES 15	1	16	
Ch 16/AES 16	33	34	
Grounds			31, 32, 35-44 inc.

44-pin 'D' connector (F) audio I/O assignments channels 17 – 32

Analog or Digital In/Out	+VE	-VE	GNDs
Ch 17/AES 17	15	30	
Ch 18/AES 18	14	29	
Ch 19/AES 19	13	28	
Ch 20/AES 20	12	27	
Ch 21/AES 21	11	26	
Ch 22/AES 22	10	25	
Ch 23/AES 23	9	24	
Ch 24/AES 24	8	23	
Ch 25/AES 25	7	22	
Ch 26/AES 26	6	21	
Ch 27/AES 27	5	20	
Ch 28/AES 28	4	19	
Ch 29/AES 29	3	18	
Ch 30/AES 30	2	17	
Ch 31/AES 31	1	16	
Ch 32/AES 32	33	34	
Grounds			31, 32, 35-44 inc.

AES/EBU inputs or outputs may be selected per pair to be either balanced or unbalanced, the settings are set via switches on the audio card (see **Appendix E**).

## Hardware Configuration

### Video/Audio Cards

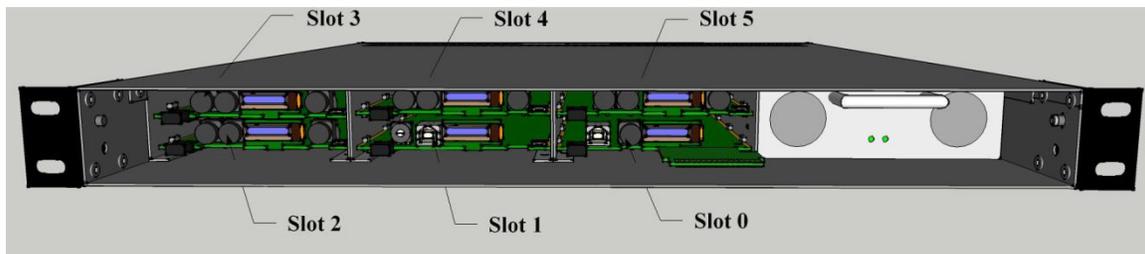
The main cards and their associated connector panel connector modules are installed in a MultiViewer in a fixed sequence depending on the audio and video requirements of the intended application.

For all applications, the MPX-NET network card can only be inserted in Slot 0 (see **Appendix A** for the main card PCB profiles). Any number of main cards can then be added consecutively up to the maximum capacity of the chassis:

- **SMP-xx MultiViewer** - five main card slots (+ MPX-NET network card)
- **MP-xx MultiViewer** - nineteen main card slots (+ MPX-NET network card)

Even when multiple MultiViewer instances are supported in a single chassis, there should be no gaps in the inserted card sequence.

The following image shows a SMP-xx MultiViewer chassis populated by a MPX-NET network card in Slot 0, followed by a MPX-MVC video output card in Slot 1 and then four VIP3 video processing cards in Slots 2 - 5. This would create a single 16 channel MultiViewer.

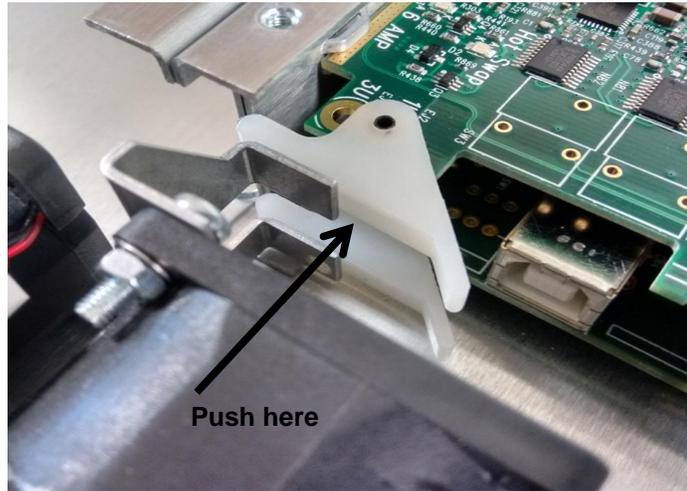


*SMP-xx main card slot locations (all occupied)*

**Note:** Installing and removing cards from the front of the SMP-xx chassis can only be carried out with the front panel removed, see the **Operation** Chapter for more details (Next Chapter).

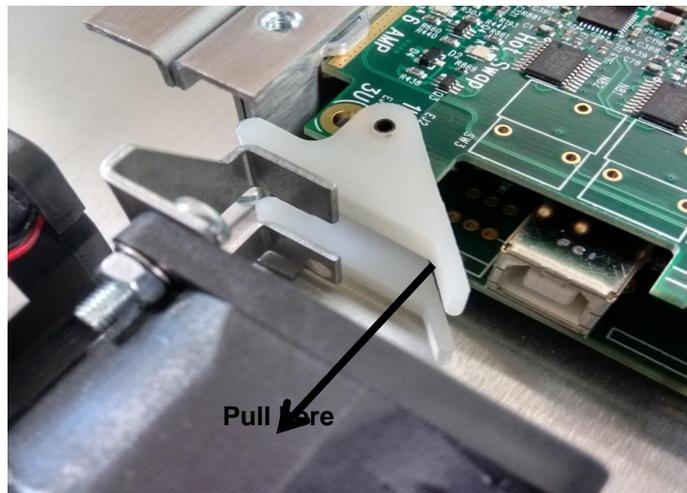
**SIERRA VIDEO**

To install a card into the chassis, push forward on the centre of the card ejector as shown in the image below. The card requires a firm push to fully seat home.



*SMP-xx main card installation (the front panel with the card retaining bracket attached to a fan is shown here gently resting against a properly installed card)*

To remove a card, simply pull the ejector back from the tip in the direction of the arrow in the image below (remove front panel first!).

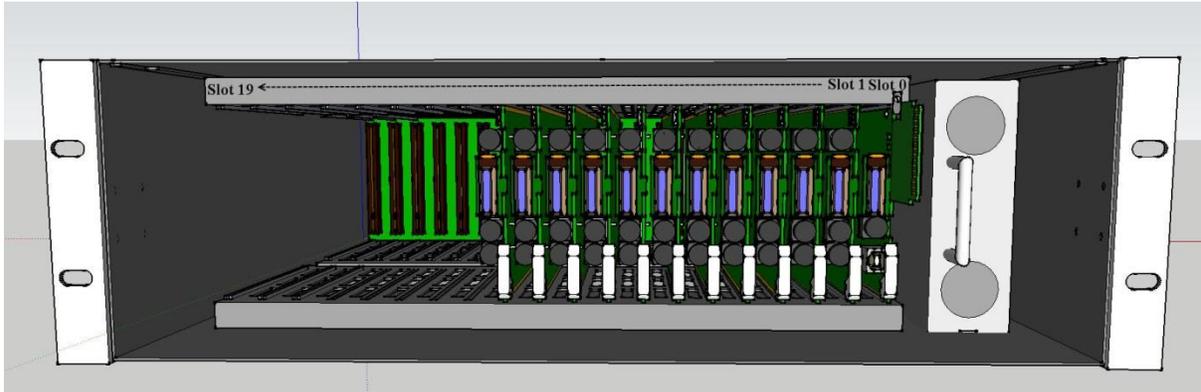


*SMP-xx main card removal*

## SIERRA VIDEO

Similarly, the following image shows the MP-xx 3RU MultiViewer chassis populated by an MPX-NET card in Slot 0, followed by an MPX-MVC card in Slot 1, nine VIP3 cards and an analog audio input card, leaving the eight left-most slots empty.

This would create a single 36 channel MultiViewer with a 32 channel external analog audio input capability.



*MP-xx MV main card slot locations (Slots 0 -11 occupied)*

**Note:** Installing and removing cards from the front of the MP-xx MV chassis can only be carried out with the front panel opened and folded out of the way. The ejectors on the main cards work in the same fashion as described previously for the SMP-xx chassis. See the **Operation** section (next chapter) for instructions on how to undo the MP-xx front panel.

## Connector Panel Connector Modules

**SMP-xx 1RU MultiViewer** – This has six connector panel slot locations corresponding to the six main card slots. With the Network main card and connector panel always located in Slot 0 (see **Appendix A** for the connector panel PCB profiles), any of the remaining five main card slots that are occupied must also have a compatible connector panel fitted in the corresponding connector panel slot.

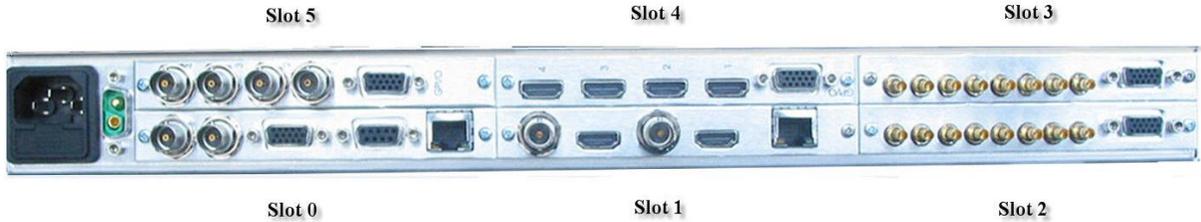
The following image shows the connector panels that would be fitted for the configuration described in the previous section. i.e. to the right of the **RMP-NET** network connector panel fitted in Slot 0 can be seen a **RMP-MVC** video output connector panel in Slot 1, followed by video input connector panels of differing types:

Slots 2-3: **RMP-SL4** 4x 1.0/2.3 miniature coaxial inputs with 4x loop-through outputs

Slot 4: **RMP-HM4** 4x HDMI video input connector panel

Slot 5: **RMP-SD4** 4x BNC video input connector panel

## SIERRA VIDEO



*SMP-xx MV connector panel slot locations*

**Note:** Any main card slot that is occupied must have a compatible connector panel fitted in the corresponding connector panel slot. However, in the case of the router equipped 1RU MultiViewer, SMP-Rxx, due to the nature of the router-based inputs to the video cards, connector panels can be fitted into slots where there is no corresponding main card fitted. This allows additional inputs to be used by the MultiViewer without the overhead of an additional video processing card if it is not required.

**MP-xx MultiViewer** – This has twenty connector panel slot locations corresponding to the twenty main card slots. With the MPX-NET network main card and RMP-NET network connector panel always located in Slot 0, any of the remaining nineteen main card slots that are occupied must also have a compatible connector panel fitted in the corresponding connector panel slot.

The following image shows the connector panels that would be fitted if the 3RU MV was configured as three independent MultiViewers:

Slot 0 is fitted with the **RMP-NET** network connector panel

**MultiViewer 1** occupies Slots 1-5:

Slot 1 - **RMP-MVC** video output connector panel

Slots 2-5 – 4x **RMP-HM4** 4x HDMI video input connector panel (16 video inputs supported)

**MultiViewer 2** occupies Slots 6-10:

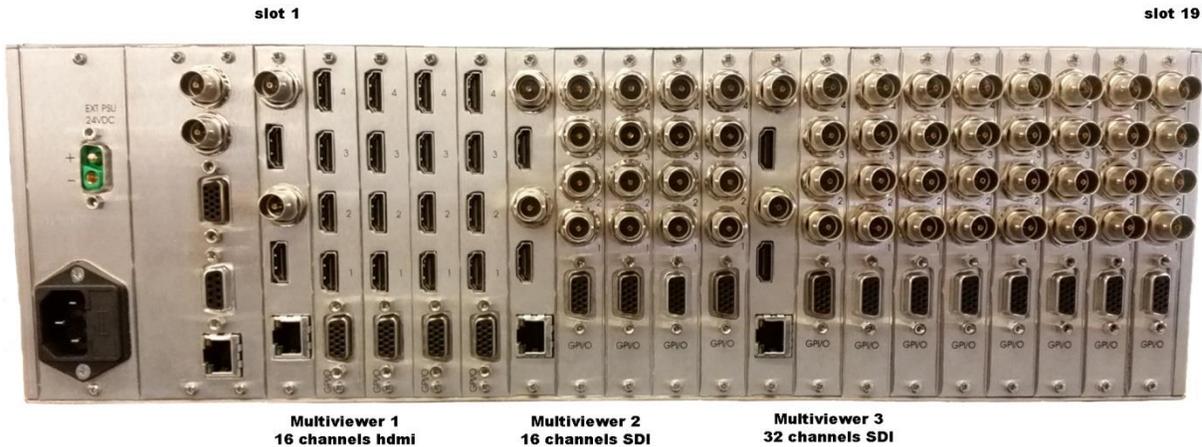
Slot 6 - **RMP-MVC** video output connector panel

Slots 7-10 – 4x **RMP-SD4** 4x BNC video input connector panel (16 video inputs supported)

**MultiViewer 3** occupies Slots 11-19:

Slot 11 - **RMP-MVC** video output connector panel

Slots 12-19 – 8x **RMP-SD4** 4x BNC video input connector panel (32 video inputs supported)



*MP-xx connector panel slot locations showing three independent MultiViewers*

**Configuration Rules**

There are several rules regarding card positioning when configuring a new MultiViewer or adding additional cards. These are listed here using connector panel views of the racks as examples:

**MPX-MVC** video output cards – these are always placed at the beginning of a video chain with any VIP video processing cards then placed in the higher slot positions.

**SMP-xx MultiViewer** - The following image shows two separate quad MultiViewer instances within a single chassis:

Slot 0 is fitted with the **RMP-NET** network connector panel

**Quad MultiViewer 1** occupies Slots 1-2:

Slot 1 - **RMP-MVC** video output connector panel

Slot 2 - **RMP-SD4** 4x BNC video input connector panel (4 video inputs supported)

**Quad MultiViewer 2** occupies Slots 3-4:

Slot 3 - **RMP-MVC** video output connector panel

Slots 4 - **RMP-SD4** 4x BNC video input connector panel (4 video inputs supported)

Slots 5 – Is fitted with a blanking panel

## SIERRA VIDEO



Connector panel view of a SMP-xx supporting two independent quad MultiViewers in a single chassis

**Note:** MultiViewer 2 can be expanded by simply installing an additional VIP card and connector panel into the empty Slot 5. However, if MultiViewer 1 requires expanding, all cards must be moved up by the one slot required to add the new card.

**MP-xx 3RU MultiViewer** – An example of a 3RU MV supporting three independent MultiViewers is shown at the top of the previous page.

**AIPxxA/D (and AIP32AD) audio input cards** – these are best placed at the end of any video processing chain. i.e. furthest from the MPX-MVC card associated with that MultiViewer.

**Note:** See **Appendix B** for an explanation on the audio channel numbering convention adopted when using multiple audio cards.

See **Appendix C** for the use of audio I/O cards in a 1RU MultiViewer fitted with the optional router capability (SMP-Rxx).

**SMP-xx MultiViewer** - The example below shows the SMP-xx chassis configured as two quad MultiViewers with MultiViewer 2 also having an audio input card fitted. In this case:

A **RMP-A32** audio I/O connector panel (AIN) is fitted in Slot 5. At the front of the chassis a single **AIPxxA analog audio input** card would have been added **after** the VIP video processing card in Slot 4.



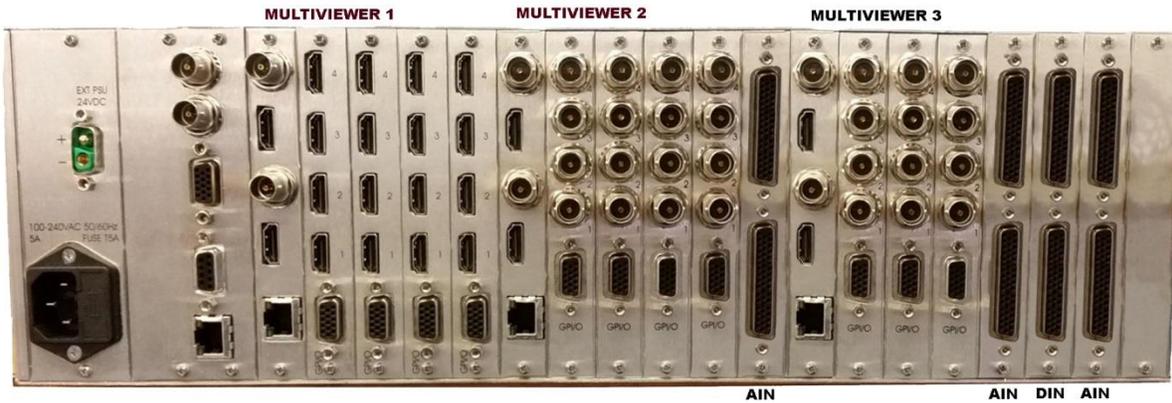
Connector panel view of a SMP-xx showing the location of **audio input** cards in the video processing chain across multiple MultiViewer instances in a single chassis

## SIERRA VIDEO

**MP-xx 3RU MultiViewer** – This example shows the MP-xx chassis configured as three MultiViewers with MultiViewers 2 and 3 fitted with a mixture of analog and digital audio input cards. In this case:

MultiViewer 2 has a **RMP-A32** audio I/O connector panel in Slot 11 (AIN). At the front of the chassis a single **AIPxxA analog audio input card** would have been added **after** the four VIP video processing cards in Slots 7-10.

MultiViewer 3 is shown with three RMP-A32 audio I/O connector panels in Slots 16-18 (AIN – DIN - DIN). At the front of the chassis a mixture of one **AIPxxD digital input** and two **AIPxxA analog audio input** cards would have been added **after** the three VIP cards in Slots 13-15.



*Connector panel view of a MP-xx showing the location of **audio input** cards in the video processing chain across multiple MultiViewer instances in a single chassis*

**Note:** For convenience, when upgrading an existing configuration, it is possible to place an AIPxxA/D audio input card in any slot in the video processing chain as long as it is higher than the associated MPX-MVC card. However, it is recommended that no more than **two** audio input cards be placed side-by-side if they are **not** at the end of the video processing chain.

**AOPxxA/D audio output cards** – these can only be placed before a MPX-MVC video output card and there is a limit of **three** if a mixture of digital and analog external audio out is required.

**Note:** See **Appendix B** for an explanation on the audio channel numbering convention adopted when using multiple audio cards.

See **Appendix C** for the use of audio I/O cards in a 1RU MultiViewer fitted with the optional router capability (SMP-Rxx).

## SIERRA VIDEO

**SMP-xx 1RU MultiViewer** - The following image shows an example where the 1RU chassis is configured as a single MultiViewer with audio output and input cards fitted. In this case:

A **RMP-A32** audio I/O connector panel (DOP) is shown in Slot 1 before the **RMP-MVC** connector panel now in Slot 2. At the front of the chassis a single **AOPxxD digital audio output** card would have been added after the MPX-NET card and **before** the MPX-MVC video output card now in Slot 2.

Another **RMP-A32** audio I/O connector panel (AIN) has also been fitted in Slot 5. At the front of the chassis a single **AIPxxA analog audio input** card would have been added **after** the two VIP cards in Slots 3-4.



*Connector panel view of a SMP-xx showing the location of an **audio output** and an **audio input** card in the video processing chain of a single MultiViewer instance*

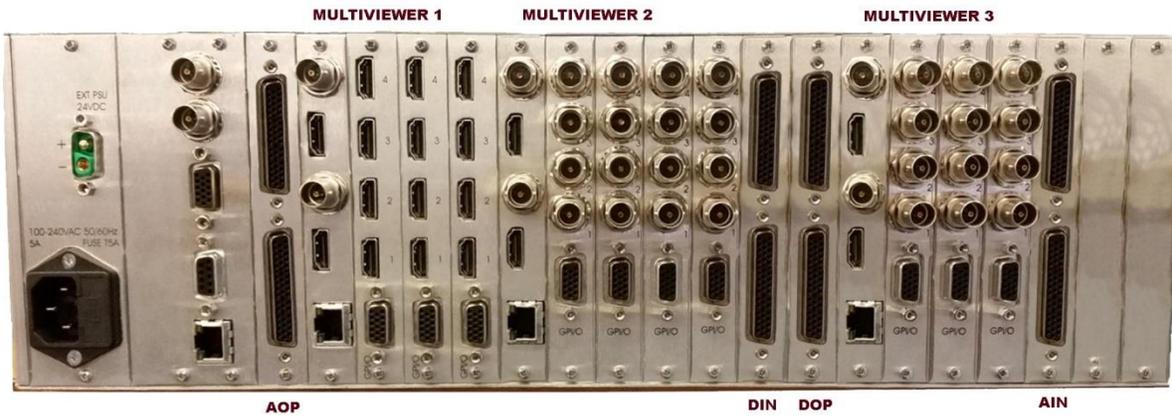
**MP-xx 3RU MultiViewer** - This example shows the MP-xx chassis configured as three MultiViewers each fitted with a mixture of analog and digital audio input and output cards. In this case;

MultiViewer 1 has a **RMP-A32** audio I/O connector panel (AOP) in Slot 1 before the **RMP-MVC** video output connector panel in Slot 2. At the front of the chassis a single **AOPxxA analog audio output** card would have been added after the MPX-NET card and **before** the MPX-MVC video output card Slot 2.

MultiViewer 2 has a single RMP-A32 (DIN) audio I/O connector panel fitted in Slot 11. At the front of the chassis an **AIPxxD digital input** card would have been added **after** the four VIP cards in Slots 7-10.

MultiViewer 3 has a RMP-A32 (DOP) connector panel in Slot 12 before the RMP-MVC connector panel in Slot 13. At the front of the chassis a single **AOPxxD digital audio output** card would have been added **before** the MPX-MVC connector panel in Slot 13. Another RMP-A32 (AIN) connector panel is also shown in Slot 17. At the front of the chassis a single **AIPxxA analog audio input** card would have been added **after** the three VIP cards in Slots 14-16.

## SIERRA VIDEO



Connector panel view of a MP-xx showing the location of **audio output** and **audio input** cards in the video processing chain across multiple MultiViewer instances in a single chassis

**Note:** The total number of external audio outputs supported per MultiViewer instance is 96 analog channels or 96 AES pairs. Combinations of analog and digital outputs can be 32 analog channels / 64 AES pairs or 64 analog channels / 32 AES pairs. If an analog/AES combination is required then both AOPxxA and AOPxxD cards must be fitted. The only valid placement combinations of the audio output cards (in any order, immediately to the left of the MVC card, as viewed from the connector panel) are:

- **1 x AOPxxA cards** – for 32 analog output channels
- **2 x AOPxxA cards** – for 64 analog output channels
- **3 x AOPxxA cards** – for 96 analog output channels
- **1 x AOPxxD card** – for 32 AES outputs (64 audio channels)
- **2 x AOPxxD card** – for 64 AES outputs (128 audio channels)
- **3 x AOPxxD card** – for 96 AES outputs (192 audio channels)
- **1 x AOPxxA + 1 x AOPxxD card** – for 32 analog and 32 AES outputs
- **1 x AOPxxA + 2 x AOPxxD card** – for 32 analog and 64 AES outputs
- **2 x AOPxxA + 1 x AOPxxD card** – for 64 analog and 32 AES outputs

**Note:** See **Appendix E** for an explanation of how to:  
Set the audio input cards up where options are available for analog/digital selection and balanced/un-balanced input terminations (model dependent).  
Set the audio output cards up balanced/un-balanced output terminations.

## Summary of Rear Connector Modules

Model Code	Description (Connector panel PCB profiles are shown in <b>Appendix A</b> )
<b>RMP-NET</b>	1x Reference, 1x Timecode, 1x Global GPI I/O (8 Input/4 Output, <b>Type 1</b> ), 1x RS-232/422 plus RJ-45 auxiliary Ethernet port. Network connector panel that is required to be fitted for <b>ALL</b> MV applications.
<b>RMP-MVC</b>	2x Type A HDMI/3G SDI Outputs plus RJ-45 Ethernet Port (for Browser control). Video output connector panel (or the <b>DVI</b> option) that is required for every MultiViewer.
<b>RMP-DVI</b>	2x DVI, 2x mini-coax 3G SDI Outputs plus RJ-45 Ethernet Port (for Browser control) Video output connector panel (or the <b>RMV</b> option) <b>that</b> is required for every MultiViewer.
<b>RMP-SD4</b>	4x BNC 3G SDI Inputs with 1x GPI/O ( <b>Type 2</b> )
<b>RMP-HM4</b>	4x Type A HDMI Inputs with 1x GPI/O ( <b>Type 2</b> )
<b>RMP-CV4</b>	4x BNC 3G SDI (All composite capable)
<b>RMP-CCTV</b>	4x BNC Composite Inputs
<b>RMP-RC3</b>	3x BNC Composite and 1x DVI Inputs
<b>RMP-H64</b>	4x BNC 3G SDI (2x composite capable) and 2 x HDMI Inputs (choose 4 from 6)
<b>RMP-HM2</b>	2x HDMI Inputs, 2x mini-coax 3G SDI Inputs plus 1x GPI/O ( <b>Type 1</b> ). There are also 2x mini-coax 3G SDI Outputs for use with the SMP-Rxx (1RU MultiViewer chassis fitted with the router backplane).
<b>RMP-SL4</b>	4 x mini-coax 3G SDI Inputs with 4x mini-coax 3G SDI loop-through Outputs plus 1x GPI/O ( <b>Type 1</b> )
<b>RMP-AN4</b>	12x mini-coax Inputs (2x 3G SDI/2x composite/2x analog component/2 x RGBHV (525/625 lines video level) to handle legacy analog video standards.
<b>RMP-A32</b>	2x 16 Channel Audio I/O connectors (32 Channels in total). This connector panel is for use with the optional AIPxxA/D input and AOPxxA/D output analog and digital audio cards.
<b>RMP-SR4</b>	4x mini-coax Inputs and 4x mini-coax Outputs plus 1x GPI/O ( <b>Type 1</b> ). This connector panel is optimised for use with the SMP-Rxx (1RU MultiViewer chassis fitted with the router backplane).

## SIERRA VIDEO

**Note:** The method of activating GPI inputs varies depending on the type of connector panel card:

**Type 1:** All connector panels other than those listed under '**Type 2**' simply require a GPI input pin to be shorted to the GND pin on the GPI connector to trigger it.

**Type 2:** The RMP-SD4 and RMP-HM4 (and some legacy connector panels) require the GPI input pin to have an external voltage in the range of 3V to 9V connected momentarily to trigger it. e.g. The external voltage source's negative terminal is connected to the GND pin of the GPI connector; the positive terminal is connected to a GPI input pin via a switch.

# Operation

The front panels for both the 1RU and 3RU MultiViewers incorporate an OLED display and selection knob for detailed status updates, a USB type A socket, three LED indicators indicating general chassis functionality and a 6.35mm headphone socket for audio monitoring.

**SMP-xx 1RU MultiViewer** - When the front panel is shut, it is securely held in place by two spring-loaded balls on either side of the panel which locate into matching indents in the chassis frame.

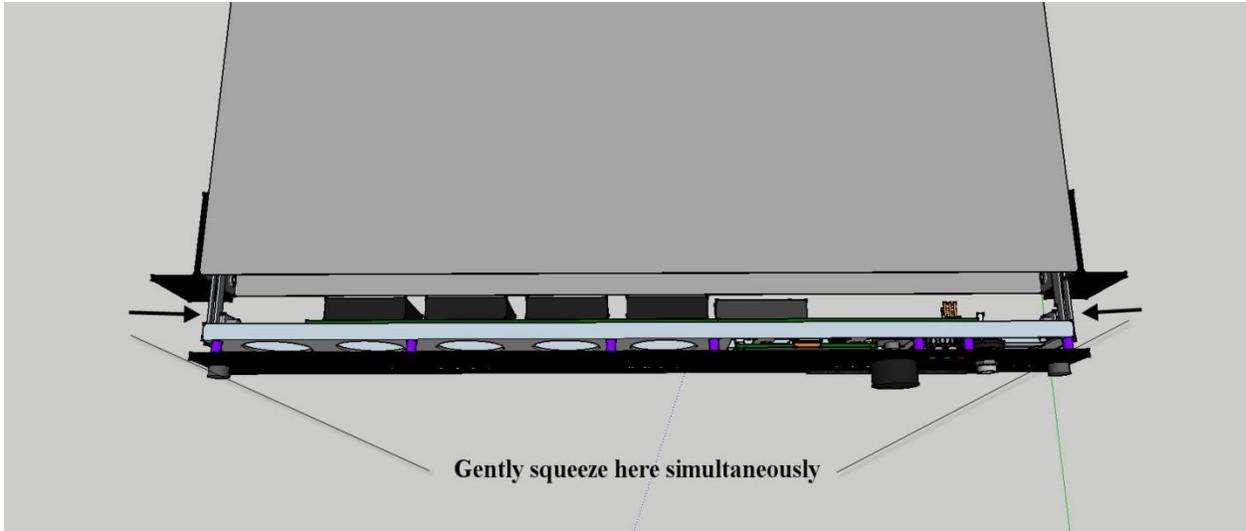


*SMP-xx MultiViewer front panel*

The front panel is mounted on an assembly that is fitted with a pair of short rails either side. Each rail engages a small pivot on the main chassis that retains the front panel when it is first removed from the chassis by **pulling** on the two silver knurled knobs mounted on either side of the front panel (Unlike the MP-xx, turning these knobs has no effect, they are designed to be pulled).

Complete front panel removal is then accomplished by gently squeezing the rails inwards; this should detach the rails from the pivots. To refit the front panel, the reverse procedure is carried out. The MPX-NET network card has an extended finger section on the front edge of the card which locates into a connector on the connector panel of the front panel. As the front panel is shut, the retaining rails should allow the MPX-NET card fingers to slide easily into this connector. If excessive resistance is met when shutting the front panel, check for obstructions.

## SIERRA VIDEO

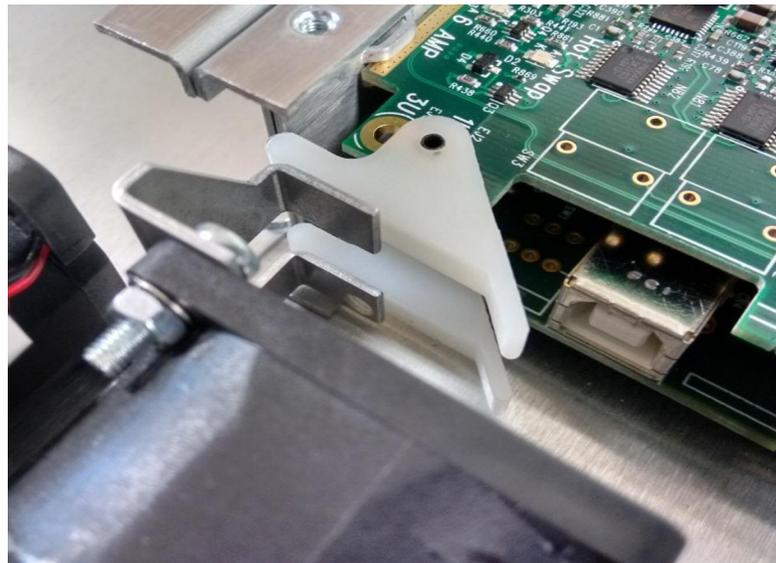


*SMP-xx 1RU MultiViewer front panel removal*

**Note:**

When the 1RU front panel has been detached, be careful when removing it completely from the chassis. Attached to three of the fans are card retaining brackets. These rest against the card ejectors when the front panel is completely closed.

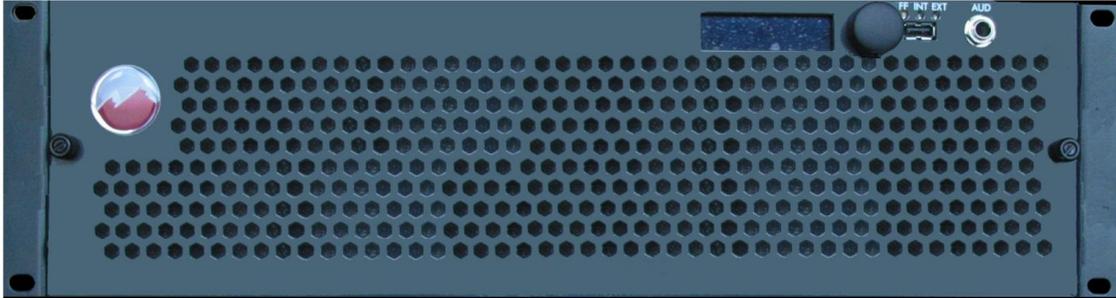
They are designed to stop the main cards from moving during transport of the chassis by resting gently against the card ejectors as shown in the following image (see **Video & Audio cards** in the Hardware configuration section which explains how the card ejectors are used).



*SMP-xx main card retaining bracket*

## SIERRA VIDEO

**MP-xx 3RU MultiViewer** - When the front panel is shut, it is securely held in place by two retaining screws on either side of the panel that locate into threaded inserts on the chassis frame.



MP-xx 3RU MultiViewer front Panel

To access the inside of the chassis, the screws are first loosened, then the front panel is pulled forward so that it can pivot downwards on a pair of retaining rails. The front panel can be opened while powered up. The MPX-NET card has an extended finger section on the front edge of the card which locate into a connector on the connector panel of the front panel. As the front panel is shut, the retaining rails should allow the MPX-NET card fingers to slide easily into this connector. If excessive resistance is met when shutting the front panel, check for obstructions.

**Note:** To maintain adequate cooling, a frame must not be run for more than two minutes with the front panel open.

The three front panel LEDs provide a quick and easy way of checking the general MV chassis is at least powered on and input voltages and fans are available and functioning correctly. Feedback from these LEDs is as follows:

**Note:** Replacing a faulty PSU is described at the beginning of the **Troubleshooting** section.

The **INT LED** should light green to indicate satisfactory operation of the internal power supply. If it is outside the range of 20V-25.5V then it lights red. If any on-board power supplies are outside their permitted ranges then the LED flashes on and off.

The **EXT LED** is for indicating the external 24V DC is available from the optional POWER-xx back up supply. If there is no backup supply present then the LED is off. If it is within the range of 20V-25.5V then it lights green. If it is outside this range then it lights red.

After the MV has booted, the **FF LED** can provide several indications:

Off for all fans working.

Flashing red for one or two fan failures.

Solid red for critical fan failure or over temperature alarm.

## SIERRA VIDEO

The front panel OLED display can be used to provide more detailed status updates but defaults to the general status display:

MV (or other product name)

STATUS: OK (or other general warning messages if there is a problem such as fan failure)

By rotating the knob to the right of the display the OLED cycles through the menu. Only various basic settings, such as network IP settings and audio monitoring volume (via the front panel jack), are configurable here.

The various modes of the menu, along with the method of navigating through it are:

- **Menu item scroll mode:** No settings are flashing, no settings are highlighted. Rotate the knob to cycle through the menu items. Press the knob to edit a setting on the current item.

- **Menu setting scroll mode:** A setting in a menu item is highlighted. (**Note:** If there is only one setting in a menu item then this mode is skipped).

Rotate the knob to cycle through the settings that are displayed on the menu item. Initially the menu waits for a setting to be selected for editing. Pressing the knob on the selected setting puts it into edit mode. Once this edit mode has been exited, as long as no further scrolling through the settings is done, pressing the knob exits the **menu setting scroll mode** and return it to **menu item scroll mode**. Alternatively, if no activity occurs on the knob for more than 30 seconds then the mode returns to **menu item scroll mode**.

- **Menu setting edit mode:** A setting in a menu item is flashing. Rotate the knob to cycle through the available values for this setting. Press the knob to save the setting and exit this edit mode. The menu returns to **menu item scroll mode** if there is only one setting in the menu item, or **menu setting scroll mode** if there are two or more settings.

## Initial Setup

The MV can be configured and controlled via the LAN, using browser software operating on a remote PC.

The MV is supplied with the factory default IP addresses:

MPX-NET card: 192.168.0.120.

MPX-MVC card: 192.168.0.121.

The LAN port on the back of the MPX-MVC card must be used for controlling the MultiViewer. Currently, the only purpose for the LAN port on the back of the MPX-NET card is for updating the MPX-NET's firmware.

To aid with initial set-up, or in the event that the MV IP address is unknown, the IP address can be checked or changed using the front panel OLED display. Cycle through the menu using the knob and edit the IP settings if necessary.

## SIERRA VIDEO

The currently set IP address is always indicated on the display output during the boot cycle. However, this may not be visible should the MV resolution setting not match the display device at that time.

All factory default settings, including the default IP address, may be recovered by means of a keyboard connected to the MV USB ports (see section on keyboard operation).

---

**Note:** If installing new MultiViewer units into an environment with existing units, check all units are running the latest firmware release. Improvements or bug fixes in the latest firmware release may result in the operation of a unit being different from those running on older firmware.

---

**Note:** In order for the browser control to operate correctly, you need to have the latest copy of Java installed on the controlling PC or laptop. See “Using the web interface” on the next page for further details.

## Network Settings

These settings only need to be manually entered if DHCP is not to be used. This would be required for a network that uses fixed IP addresses and does not rely on a DHCP server to allocate them automatically.

IP settings can be configured from the front panel OLED menu, or via the LAN using the MultiViewer web interface.

If the MultiViewer is currently set to an IP address that cannot be reached by a PC's current network settings then the web interface does not work – in that case the front panel OLED menu is the best option for setting up the network.

---

**Note:** Only the LAN port on the **RMP-MVC** connector panel card can be used to access the browser control.

---

**Tip:** The IP address must be unique on the network. See your system administrator if these details are required.

## Keyboard Operation

Any HID compliant USB keyboard can be used for the entry and editing of UMDs. The keyboard is connected to the USB port on the front panel of the MV.

The Tab key activates the cursor on the topmost UMD. Successive Tab key operation moves the cursor on to the next UMD in sequence. The Esc key deactivates the cursor.

All MultiViewer factory default settings (including the IP address) are restored by pressing Ctrl-Alt-Del on the keyboard. This brings up a menu indicating which key should be pressed next to determine the extent of restoration.

If the screen is not visible when doing a factory reset then the sequence is:

- Ctrl-Alt-Del then 1 to only restore factory settings, or
- Ctrl-Alt-Del then 2 to restore factory settings and delete all logos, layouts and other user settings.

If any other key is pressed or no key is pressed in 60 seconds then the screen returns to the normal MultiViewer layout.

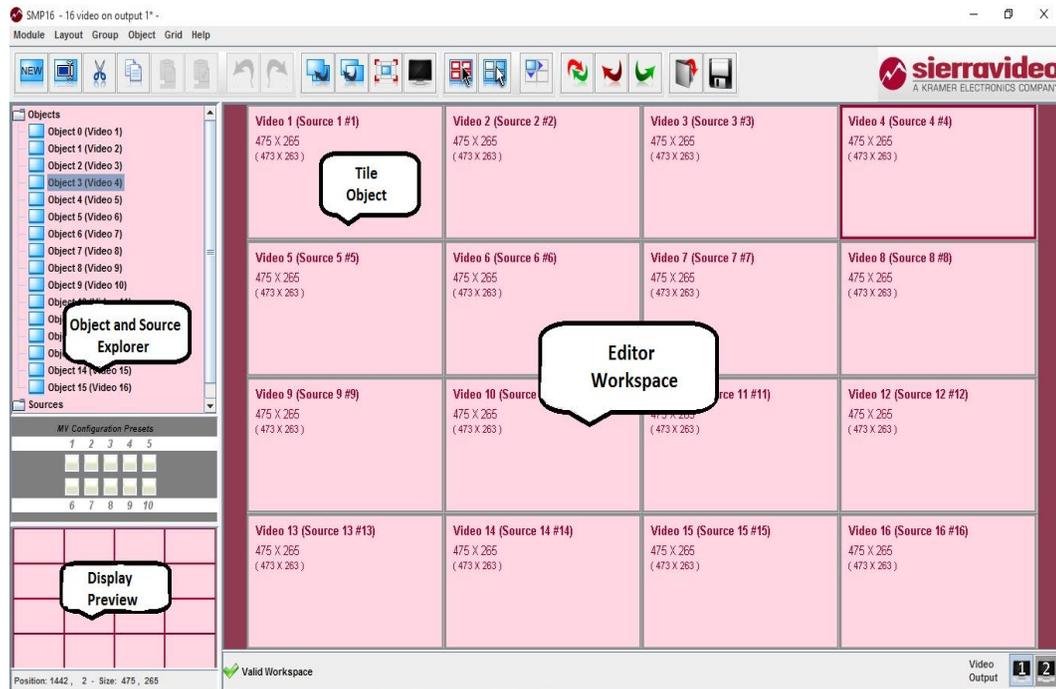
## Using the Web Interface

The MV is configured via a browser using web pages hosted by the MPX-MVC card. Note that Java must first be installed on the PC or MAC that is to be used. This is available as a free download from: <http://www.java.com/en/download/manual.jsp>

Ensure that the MV has been connected via the correct LAN port (i.e. that on the **RMP-MVC connector panel** - see section on Network settings). To access the web interface, type the IP Address configured for the MultiViewer instance into a browser and the Java application should launch immediately. Java certificates should not need to be imported, but if the certificate is not already on the system being used, then Java asks for permission to continue before starting the applet (the certificate required is stored in the MV). If 'Run' is selected without ticking the box for 'Always trust content from this publisher', then the certificate is not installed, but the applet runs. It is best to tick the box so that the certificate is installed to avoid seeing the same message next time the browser is to be accessed (assuming that the same system is to be used).

Note that depending on the system being used to access the web interface, one or more factors such as Windows security, third party security products, firewalls and browser security settings may prevent the applet loading from the MV. For example, if using MS Internet Explorer 7, the security setting should be no higher than 'Mid'.

**Note:** The default IP address is 192.168.0.121 (see Initial Setup section above for more details)



*The MV MultiViewer User Interface*

The web interface comprises three areas, the *Object and Source Explorer*, the *Editor Workspace* and the *Display Preview*.

Tile objects can be one of six basic types;

## SIERRA VIDEO

- *None*
- *Video*
- *Audio*
- *Text*
- *Logo*
- *Clock*.

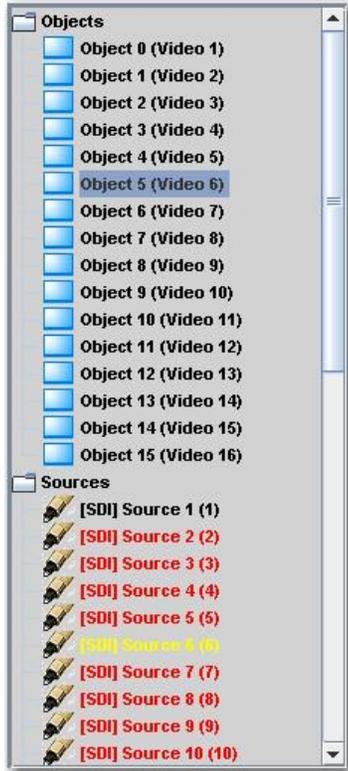
The color of the tile as it appears in the Editor Workspace and Display Preview indicates the currently set object type, as listed in the table below.

<b>Object Type</b>	<b>Tile Color</b>
None	Grey
Video	Blue
Audio	Green
Text	Brown
Logo	Red
Clock	Dark Grey
Timer	Black

Operation is designed to be simple and intuitive. For example, object type can be selected by double clicking on a tile, selecting the *Type* tab from the *Edit Object* menu and choosing the desired tile type. Video and audio tiles can be assigned sources by double clicking on a tile, selecting the *Properties* tab from the *Edit Object* menu and selecting an available source.

The currently selected tile object is highlighted with a red border. Tiles can be moved and resized using conventional mouse operations. For example, multiple tiles may be selected for moving as a group by holding the Ctrl key while clicking on each tile in turn. A small square appears in the lower right corner of tiles grouped within a multiple selection. Tile borders may appear incomplete to indicate where they lie behind other objects.

## Object and Source Explorer



The *Objects* folder contains the list of current objects and each object's given name. The currently selected object is highlighted.

The *Sources* folder contains the list of video and audio sources, with an indication of the source type. Those sources that are currently assigned to an object appear in red, whereas those that are currently unassigned to an object appear in black. A source that is assigned to the currently selected tile / object appears in yellow.

The Edit Object menu can also be displayed for a tile by double clicking on its entry in the *Object Folder* in the *Explorer* view. Audio and Alarm settings can be configured for each source by double clicking on its entry in the *Source Folder* in the *Explorer* view.

Right-click context menus provide quick access to tile object menus and commonly used functions are presented in the top tool bar for ease of use.

---

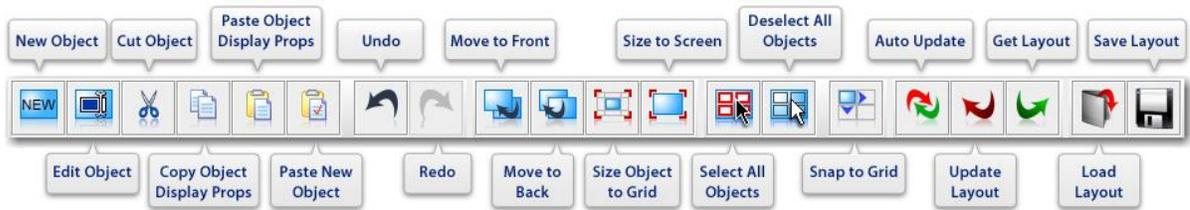
**Note:** The 'Valid Workspace' icon below the Editor Workspace confirms the validity of the configuration currently displayed in the browser. This is replaced by an error message should there be a conflicting setting. The tile/s with which the conflict is associated is outlined in red.

---

**Note:** The browser contains an initial 'factory default' layout. The number of tiles indicated reflects the number of video sources supported by the current video input card configuration (e.g. sixteen tiles for four video input cards).

## Navigating the User Interface

Settings for MultiViewer objects can be accessed from the *Module*, *Layout*, *Group* and *Object* menus, or by using the buttons on the toolbar.

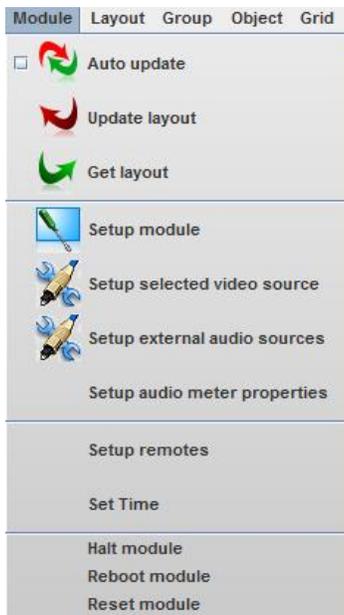


**Note:** Some functions are only available from the toolbar.

## Main Menus

### Module Menu

The Module Menu allows a module's global settings to be configured.



**Auto update** – automatically update tile layout to the display output and preview every time it is changed in the edit workspace.

**Update layout** - transfer edit workspace layout to display output and preview.

**Get layout** - transfer the current display layout to the edit workspace.

**Setup module** - opens the [Module Properties](#) dialogue.

**Setup selected video source** - opens the [Source Properties](#) dialogue of the currently selected tile object.

**Setup external audio sources** – opens the **Audio source properties** dialog where references, thresholds and alarms can be set.

## SIERRA VIDEO

**Setup audio meter properties** – opens the dialog for configuring global properties of audio meters. Here the over-level, upper-level, and lower-level regions can be configured for each audio meter type available.

**Setup remotes** - opens the **Remote Control Setup** dialogue for setting up of the (now discontinued) legacy REMOTE-mv.

---

**Note:** The error message, '*Selected object has no source*', appears if the current object is not an audio or video object.

---

**Note:** The REMOTE-mv is discontinued but it is compatible with the new MV – details mentioned here relate only to integration of REMOTE-mv from legacy installations. See the MV-xx user manual in the discontinued section of the website for details of how to set this up if required.

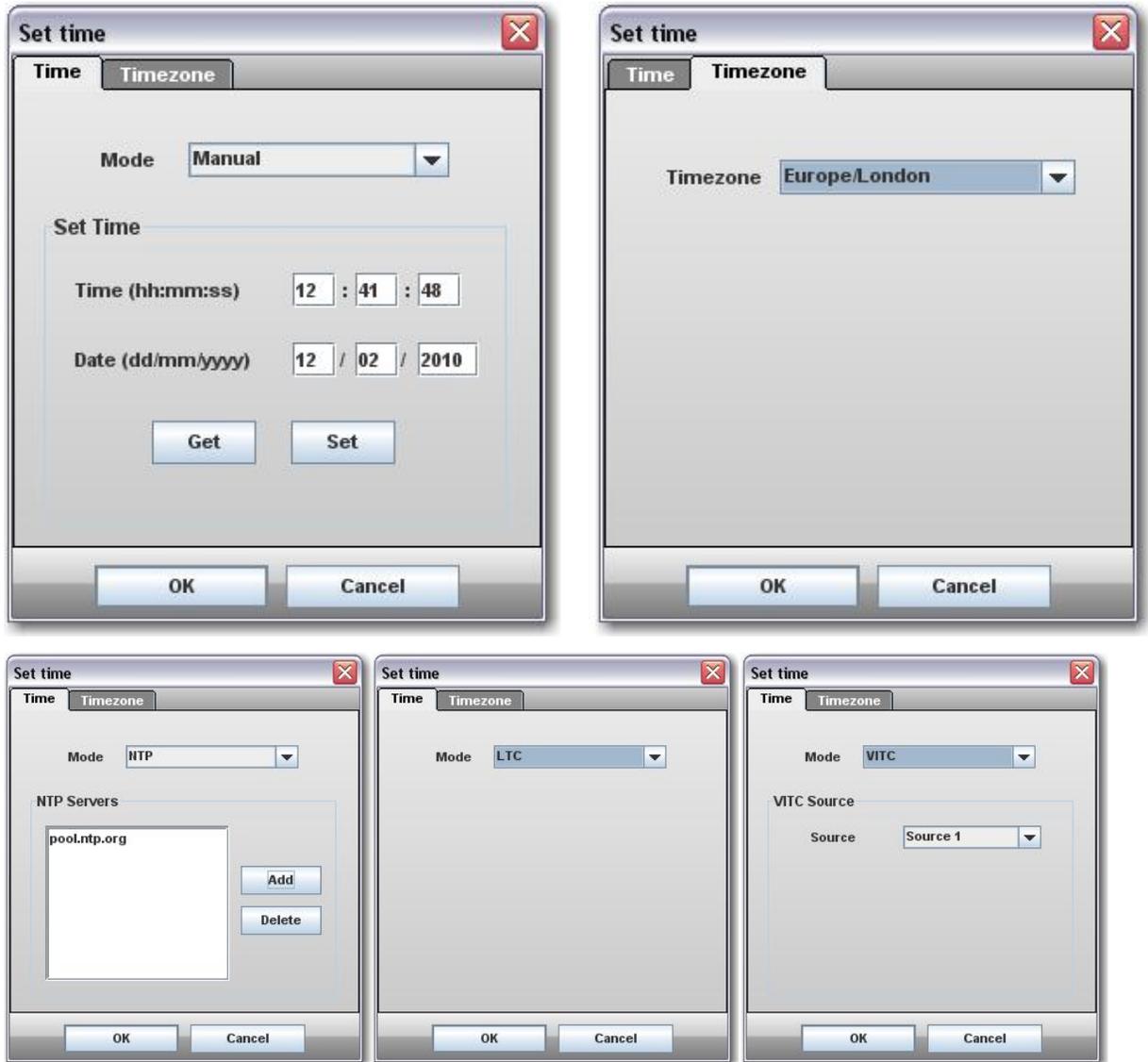
**Set Time** - opens the [Set Time](#) dialogue to adjust the clock and date settings.

**Halt, Reboot, Reset Module** – maintenance items for shutting down, rebooting the system, or resetting input/output cards. The task that each of these execute is:

- **Halting** the module guarantees that any files that have not been saved yet, such as layout ones, gets saved before powering off the frame. This stops the system from running. The only way to restart it is to power off – power on again.
- **Rebooting** the module shuts the system down and start it back up again. This can take up to 70 seconds.

**Resetting** the module leaves the CPU running, but resets and reloads the firmware into all the input/output cards.

## Set Time



Clock/date display data can be derived from several sources; the system clock, NTP synchronisation, LTC, or VITC from a chosen SDI input.

The clock source is set by going to the Set Time item in the Module menu. Here there are two tabs, Time and Timezone. The time zone should be set to the appropriate region before adjusting the clock.

To set the clock source, go to the Time tab and select the desired source – Manual, NTP, LTC or VITC. The setup procedures for each mode are:

- **Manual:** In this mode the time and date of the system clock is shown and can be adjusted. Press the Get button to show the current time. To adjust the time enter the new time and date in the appropriate fields and then press the Set button. A battery on the CPU board ensures that time data is retained should the unit be powered down.

- **NTP:** In this mode the time is sourced from an NTP server (or multiple NTP servers can be entered). Press the Add button to add a new server, and enter the host name or IP address of the new server.
- **LTC:** In this mode the time is sourced from the LTC input on the Network connector panel. There is nothing to set-up here; there just needs to be LTC present for this to work properly. If no LTC is present then the system clock is used. (If LTC is present but later disappears then the clock continues advancing without any discontinuity).
- **VITC:** Here the time can come from VITC that is present on any SDI input. Select the chosen SDI source number that contains VITC. If no VITC is present then the system clock is used. (If VITC is present but later disappears then the clock continues advancing without any discontinuity).

## Layout Menu

The layout menu allows layouts to be created, saved, deleted and for layout settings to be chosen for new layouts.



**New layout** - offers to save the current layout before removing all objects from the editor workspace ready to create a new layout.

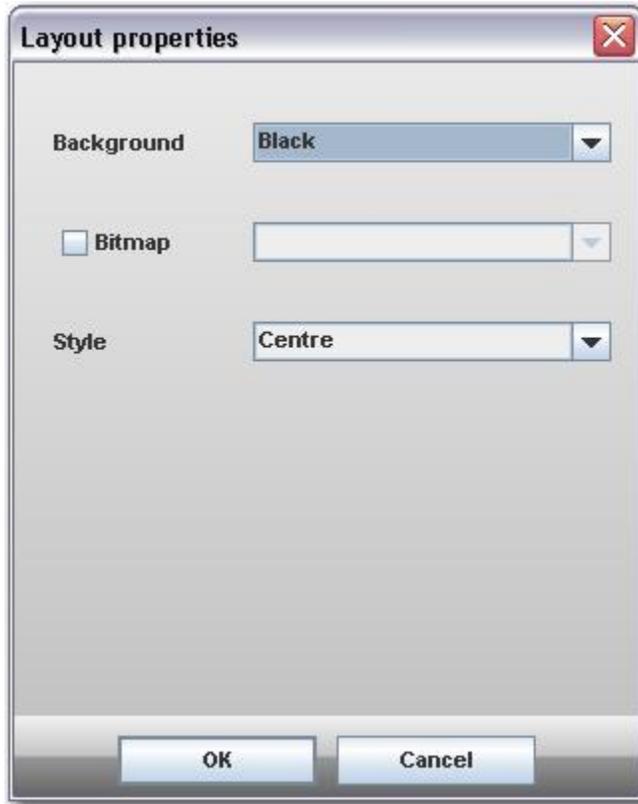
**Load layout** - loads a previously saved layout.

**Save layout** - saves current layout. A name must be given if this is the first time the layout has been saved.

**Save layout as** - saves current layout with a different name.

**Delete layout** - delete a selected layout from the saved list.

**Setup layout** - opens the *Layout Properties* window (see below). Choose background type from transparent, color or bitmap. Also choose new layout style from Centre, Tile or Scale.



**Background** - set the display background color.

**Bitmap** - apply selected bitmap to the background.

**Style** - select bitmap style: Centre (centres bitmap); Tile (display bitmap in multiple tiles); or Scale (scales bitmap to fit the display background).

## Group Menu

The group menu allows objects to be selected as a group.



## SIERRA VIDEO

**Select all objects** - all objects in the layout are selected and can be operated on as a group.

**Unselect all objects** - cancels Select all objects command.

**Cut objects** – deletes all the tile objects in the group.

**Paste objects** – pastes the object that is on the clipboard to all objects in the group.

**Move objects to front/back** – moves all tile objects in the group to the front/back.

---

**Tip:** Objects can be selected individually to create a group by holding the Ctrl key down before clicking on them.

## Object Menu

The settings for the tiles can be manipulated from the object menu. This is accessed either via the main menu, or by a right-click on the tile to be edited.



**New object** - creates a new object and opens the *Edit Object Dialogue* described in the *Edit Object Dialogue* section.

**Edit object** - open the *Edit Object Dialogue* for the tile object that is currently selected.

**Cut object** - delete the currently selected tile object.

**Copy object** - copy the display properties of the currently selected tile object (excludes source properties).

## SIERRA VIDEO

**Paste object** - paste the copied display properties to the currently selected tile object.

**Paste new object** - create a new object and paste to it any previously copied display properties.

**Move object to front** - send the currently selected tile object in front of all other objects.

**Move object to back** - send the currently selected tile object behind all other objects.

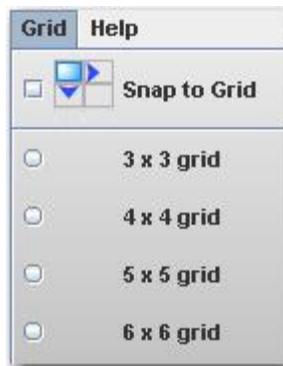
**Fit object on to grid** – expands all edges of the currently selected tile object to the nearest grid.

**Size object to grid** – sets the size of the currently selected tile object to the chosen grid pitch.

**Size object to screen** - set the selected tile object to full-screen size.

## Grid Menu

The grid menu enables the Editor Workspace to be defined by a grid for ease of aligning tiles in a regular arrangement. The *Size Object to Grid* function in the main toolbar works in conjunction with this feature and automatically sizes the currently selected tile to the cell size of the grid that has been set.



**Snap to Grid** – check to enable tiles to be snapped to the nearest grid position when repositioning. The top left corner of the tile is anchored to the top left corner of the grid position.

**3 x 3 grid** – check to define a 3 x 3 grid.

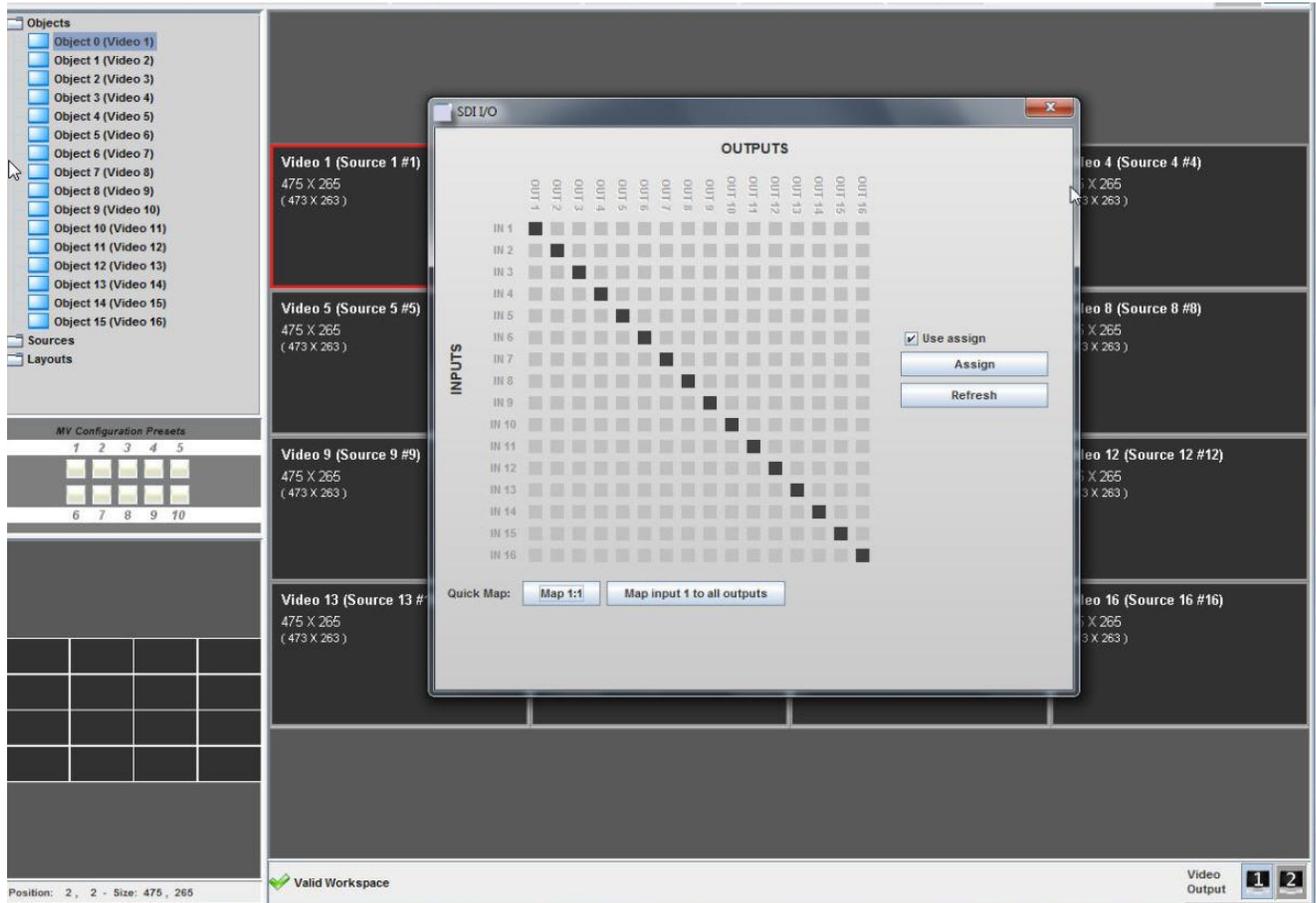
**4 x 4 grid** – check to define a 4 x 4 grid.

**5 x 5 grid** – check to define a 5 x 5 grid.

**6 x 6 grid** – check to define a 6 x 6 grid.

## 16x16 SDI I/O Router Menu (SMP-Rxx 1RU MultiViewer option only)

The SMP-xx MultiViewer chassis can be supplied with an optional 16x16 SDI router capability that, when coupled with the **RMP-SR4** router connector panels, allows the MultiViewer to be used as a stand-alone 3G HD-SDI router without compromising any MultiViewer capabilities.



The matrix map image shows all the input to output routing and allows it to be changed by selecting a cross-point. If the cross-point can be routed then it is shown as a tick box. If it cannot be routed then the cross-point appears as a dark grey box when selected, a light grey box when not selected.

**Note:** Only cross-points that have an input and output on a **RMP-SR4** router connector panel or an **RMP-HM2** can be routed (i.e. Only **SDI** inputs can be routed).

**INPUTS** – each available input is shown down the left hand side of the router selection control matrix: **IN1-16**

## SIERRA VIDEO

**OUTPUTS** – each available output is shown along the top of the router selection control matrix: **OUT1-16**

**Use assign** – enables router matrix selection to be implemented via **Assign** rather than on the fly via the router selection control matrix.

**Assign** – initiates router selection matrix when enabled.

**Refresh** – manually forces a video standard read on all inputs.

### **Quick Map:**

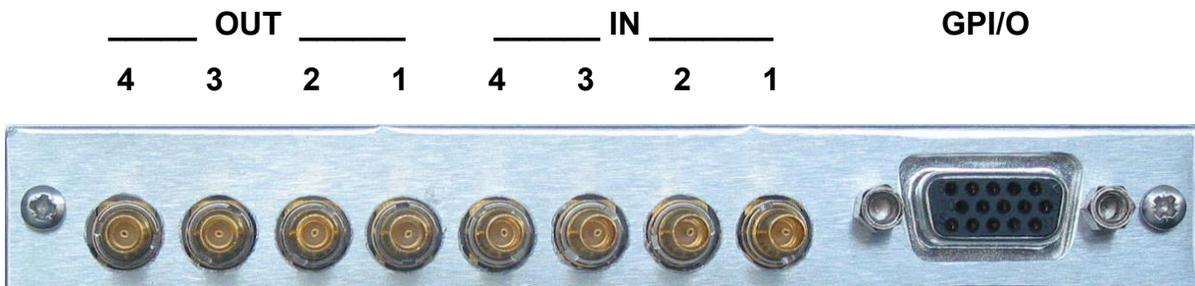
**Map 1:1, 2:2, 3:3 etc.** – forces router into default 1:1 mapping state.

**Map INPUT 1 to all OUTPUTS** – assigns Input 1 source data to all destinations to aid in system functionality testing.

**RMP-SR4-xxxx connector panel** - To make full use of the SMP-Rxx router functionality a specific router connector panel, the SR4, is available fitted with eight miniature coaxial connectors offering four 3G SDI inputs and four 3G SDI outputs as shown in the image below.

Options: **RMP-SR4-MBNC** (8x micro (HD)-BNC fitted)

**RMP-SR4-1023** (8x 1.0/2.3 coaxial connectors fitted)



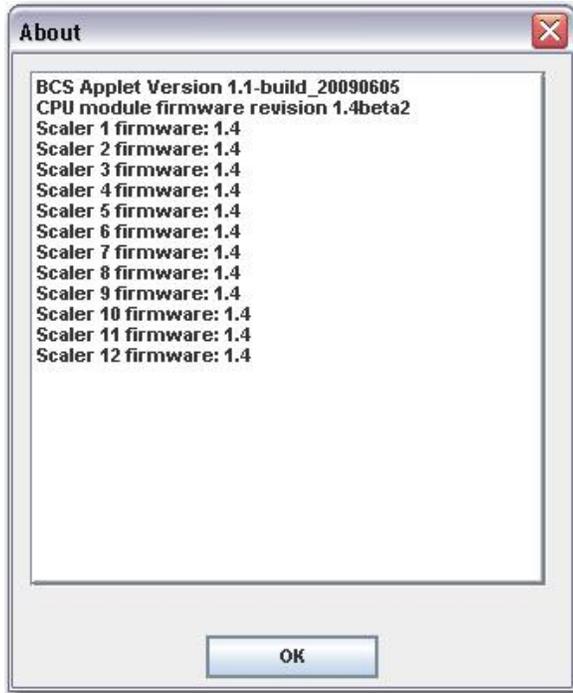
***RMP-SR4** connector panel with 4x 3G SDI video inputs and 4x 3G SDI video outputs and 15way GPI/O*

**Note:** If the **RMP-SR4-xxxx connector panel** is used in a non-router SMP-Sxx or the 3RU MP-xx, only the 4x 3G SDI video inputs are active and function in the same way as an **RMP-SD4** connector panel. The 4 x router outputs are non-functional in this instance.

## Help Menu

### About

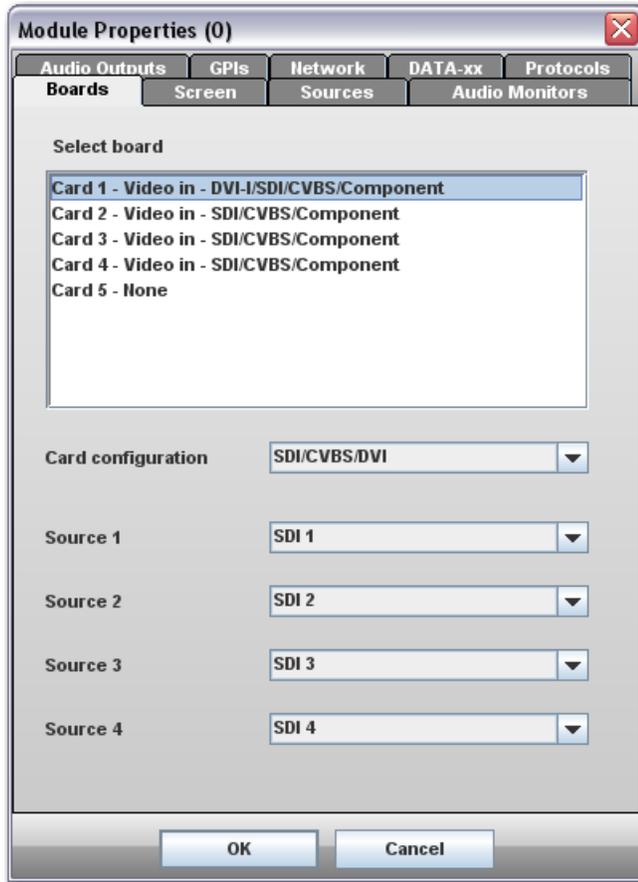
This menu provides current status information on the Browser, MPX-NET network card and scaler firmware versions.



## Module Properties

Module Properties are opened from *Setup Module* in the *Module* menu.

### Boards Tab

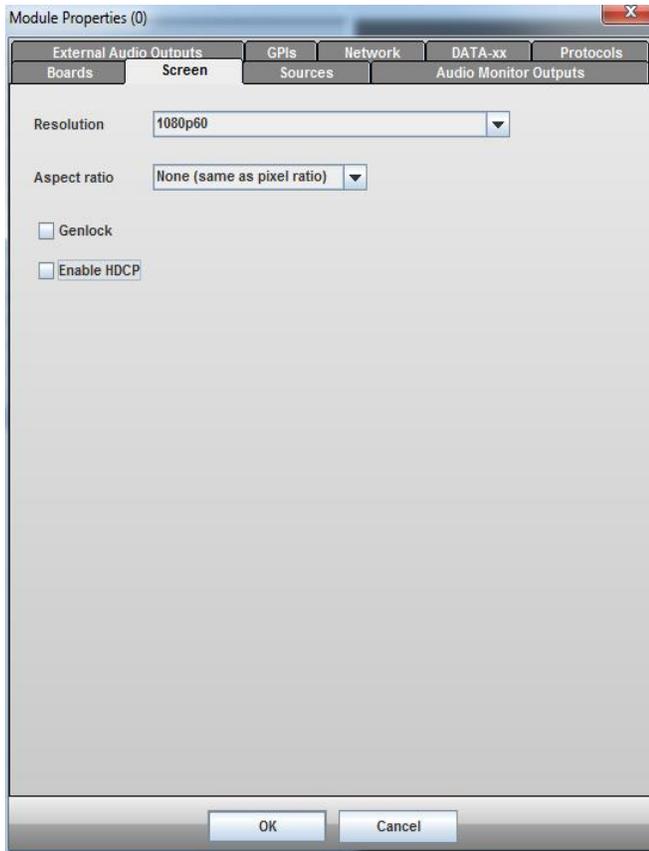


**Select board** - select a board to define sources.

**Card configuration** - show selected card configuration.

**Source 1 to 4** - select source type from drop down list for each input.

## Screen Tab



**Resolution** - set the display output resolution (see **Signal Outputs** for table of all HDMI and SDI output standards supported).

**Aspect ratio** - set the display output aspect ratio to match the display device.

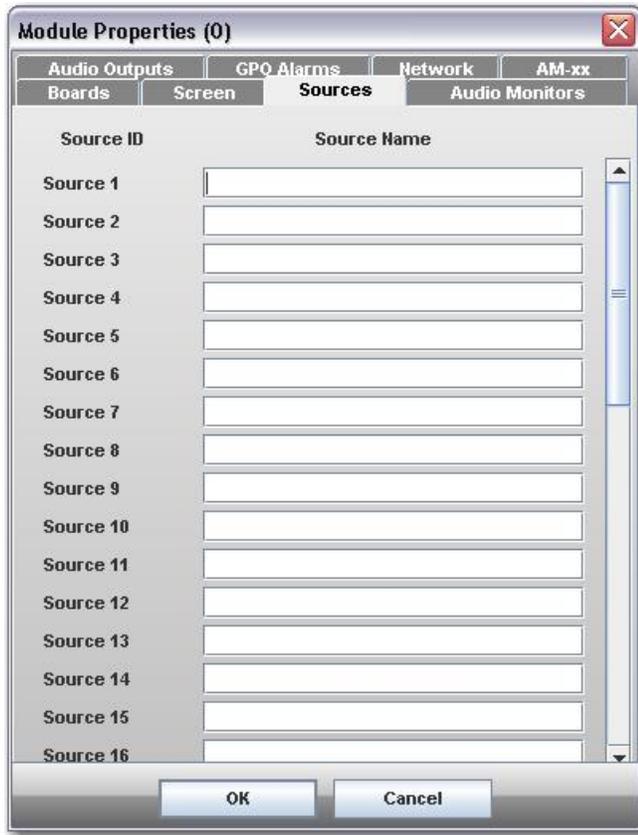
**Genlock** - lock the display output to the MV external reference.

**Enable HDCP** - enable / disable HDCP on HDMI inputs and outputs

**Note:** When HDCP is disabled, the images of any HDCP inputs do not appear on the output monitors. The video tiles containing HDCP inputs are black, and have a warning message indicating the input format of the video and that it is HDCP. HDCP is not used on the HDMI outputs in this instance.

When HDCP is enabled, the HDMI monitors attached to the outputs must be HDCP compliant, otherwise no video appears. The images of HDCP inputs appear as normal video.

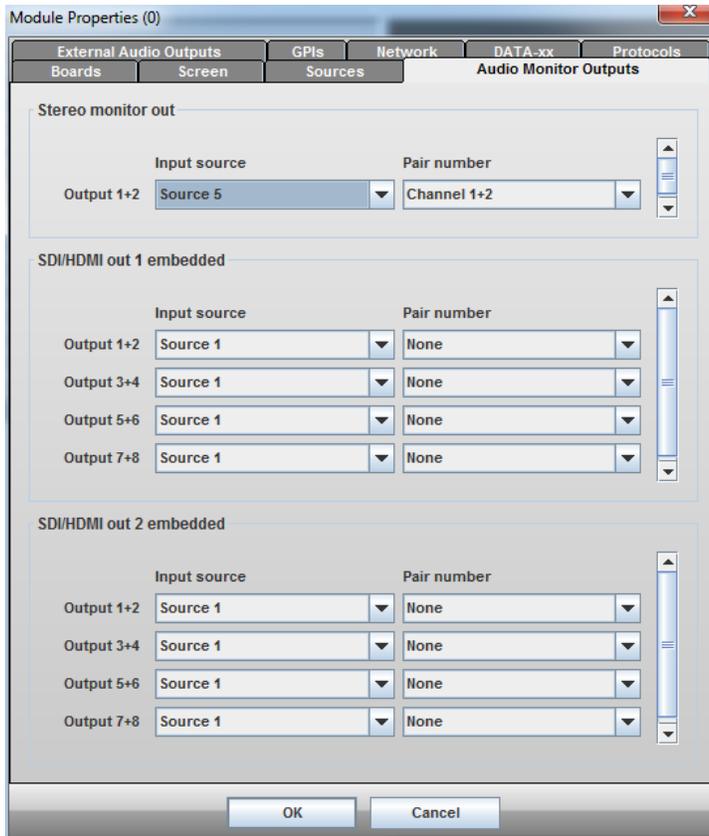
## Sources Tab



**Source Name** – enables the naming of sources. These are not names that get transferred to UMDs or anything of that nature. They are simply user names to assist with identifying sources within the Web interface.

**Note** – Source names can be used to set the TSL Display address when using the TSL protocol for controlling UMDs and tallies (see **TSL Protocol Options**).

## Audio Monitor Outputs Tab

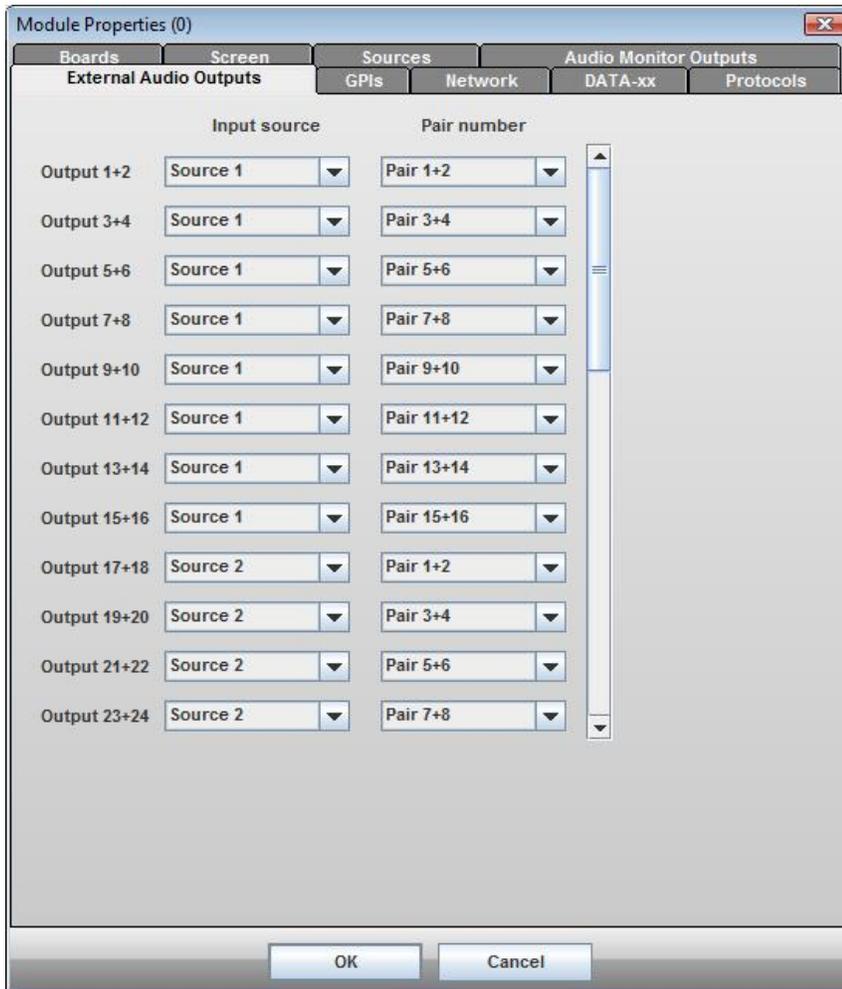


**Stereo monitor out** - audio monitor output pair selection controls for the stereo jack on the front of the frame. Select the source and source pair number to be directed to the monitor output. Input source numbers refer to the video input number (for embedded audio pairs), or at the end of the source list there is External Audio. When a video source is selected, the pair numbers available are 1+2 up to 15+16 (the 8 pairs of embedded audio). When External Audio is the selected source, the available pairs are 1+2 up to 255+256, regardless of how many external audio input cards are actually present.

**SDI/HDMI out 1/2 embedded** - audio monitor output pair selection controls for the 2 SDI/HDMI outputs. Select the source and source pair number to be directed to the respective embedded audio pair on the SDI/HDMI output. Input source numbers refer to the video input number (for embedded audio pairs), or at the end of the source list there is External Audio. When a video source is selected, the pair numbers available are 1+2 up to 15+16 (the 8 pairs of embedded audio). When External Audio is the selected source, the available pairs are 1+2 up to 255+256, regardless of how many external audio input cards are actually present.

**Note:** Dolby E audio cannot be decoded for monitoring. Only embedded PCM audio from SDI or HDMI inputs, or PCM or analog audio from external audio input cards can be monitored.

## Audio Outputs Tab

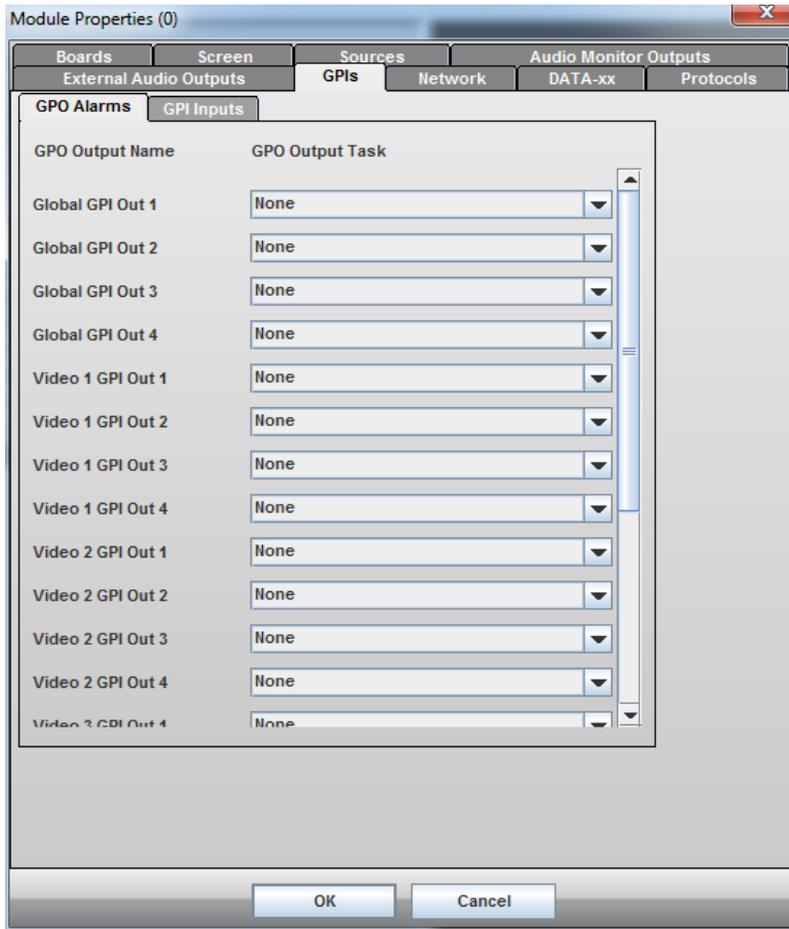


**Output Pairs** - audio output pair selection controls for when external audio output cards are installed. Select the source and audio pair number to be directed to the output pair. Input source numbers refer to the video input number (for embedded audio pairs), or at the end of the source list there is External Audio. When a video source is selected, the pair numbers available are 1+2 up to 15+16 (the 8 pairs of embedded audio). When External Audio is the selected source, the available pairs are 1+2 up to 127+128, regardless of how many external audio input cards are actually present.

**Note:**

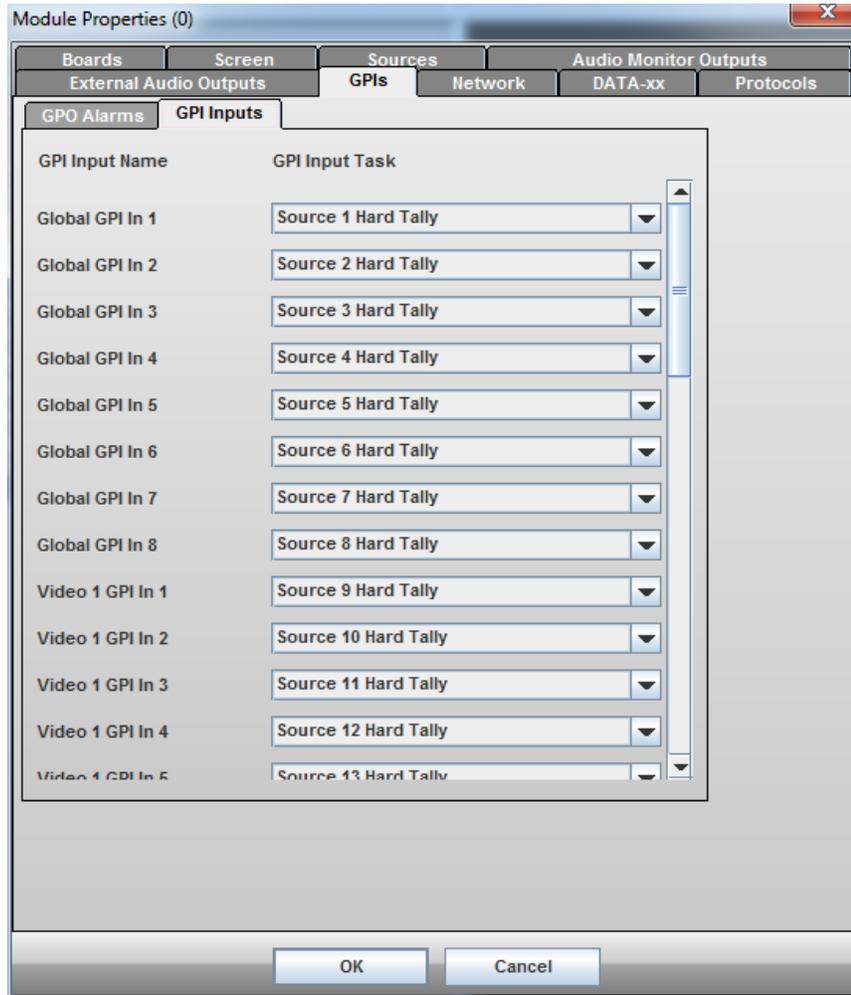
Dolby E cannot be decoded and monitored. The sources of audio that can be monitored are non-Dolby SDI embedded in, HDMI embedded in, and PCM or analog audio in from the AIPxxA/D audio input cards.

### GPO Alarms Tab



**GPO Output Task** – assign alarm source to the selected GPI alarm output number.

### GPI Inputs Tab



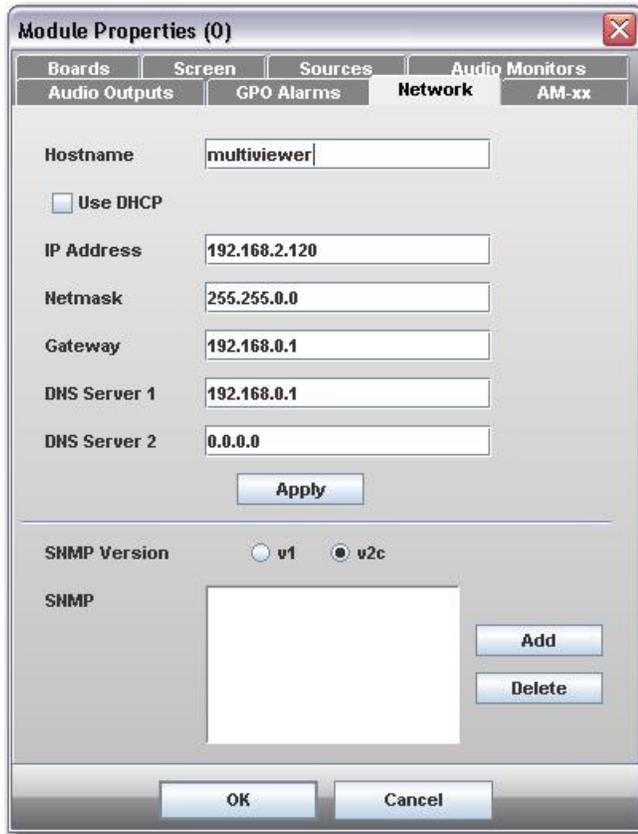
This sets up the task to execute on each GPI input when activated. Some tasks are level sensitive (contact closure closed = on, open = off), whereas others are transition sensitive (a transition from open to closed toggles the current state).

An example of a level sensitive task is the Hardware Tally: open switches the tally off, closed switches the tally on.

An example of a transition sensitive task is the Full Screen Toggle: if the relevant window is currently at its normal size then a transition from open to closed switches it to full screen; if it is at its full screen size then the transition switches it back to its normal size.

Edge sensitive tasks can be identified as the ones that have "toggle" in their name.

## Network Tab



**Hostname** - enter friendly name for MV.

**Use DHCP** - check to use DHCP for automatic acquisition of network settings. Uncheck for entry of fixed network settings.

**IP Address** - enter fixed IP address.

**Netmask** - enter network mask, if required.

**Gateway** - enter gateway address, if required.

**DNS Server 1** - enter DNS server address, if required.

**DNS Server 2** - enter DNS server address, if required.

**Apply** - applies fixed network settings to the frame.

**SNMP** - check required SNMP version.

**Add** - reveals dialogue for entering SNMP IP address and adding to list.

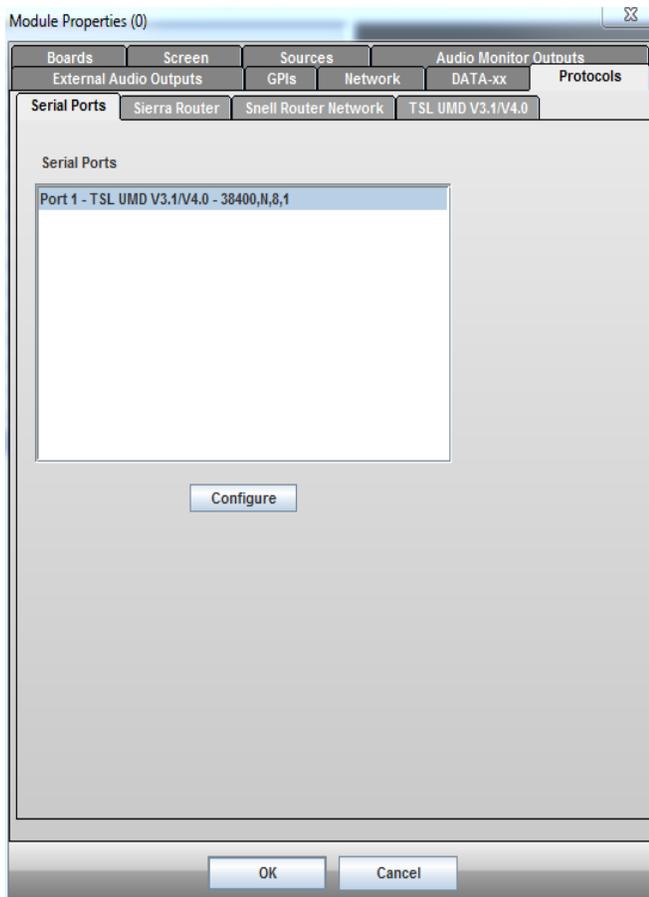
**Delete** - deletes selected SNMP IP address from the list.

### **DATA-xx Tab**

Opens the **DATA-xx Setup** dialogue for setting up of the (now discontinued) legacy DATA-xx. DATA-xx is a separate 1RU based hardware device for converting multi-channel audio into level data that can be distributed via a LAN.

**Note:** The DATA-xx is discontinued but it is compatible with the new MV – details mentioned here relate only to integration of DATA-xx from legacy installations. See the MV-xx user manual in the discontinued section of the website for details of how to set this up if required.

### **Protocols – Serial Ports Tab**



This shows the serial ports that are available and the current settings applied to the ports. To change these settings press the Configure button that opens the following dialog box.

## SIERRA VIDEO

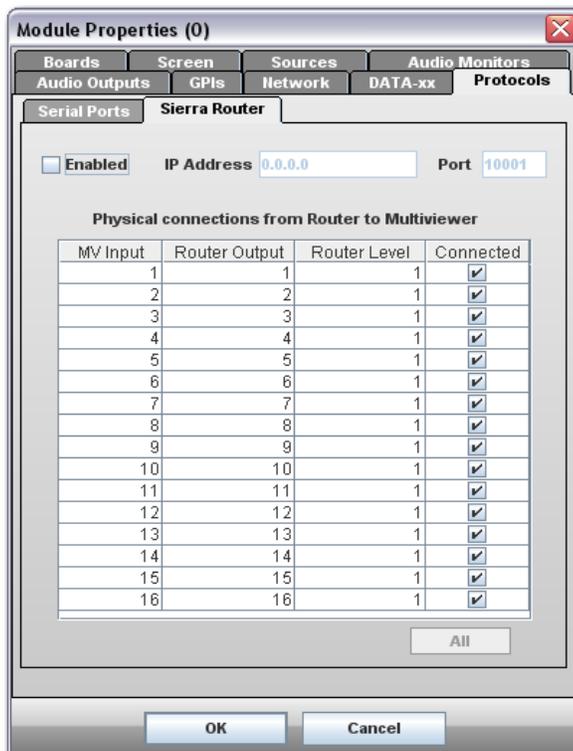


This allows editing of the serial port settings. The settings specified for the TSL UMD 3.1/4.0 protocol are baud rate = 38400, data bits = 8, parity = even, stop bits = 1, flow control = none. However, this can be changed if non-standard settings are being used by the TSL control unit.

For other protocols, determine what the serial port settings are for the device attached, and set them accordingly here.

If the Sierra Router protocol is selected then the physical connections from the router to the MultiViewer table as described in the following section applies.

### Protocols – Sierra Router Tab



## SIERRA VIDEO

This allows the physical connections between the Sierra router and the MV, and the configuration of the TCP settings of a connection to a Sierra Video Router to be configured. Once the connection to the router has been established, the first row of UMDs in each video window acquires the applicable source names of the router according to the source that is feeding the destinations connected to the MultiViewer. As cross-points are changed in the router, the UMDs are updated dynamically.

The **Physical connections from Router to MultiViewer** table allows setting up of the wiring between the router's physical outputs and the MultiViewers physical inputs. (This table also applies to the serial port settings if the router is being communicated with through the serial port). The columns are:

- **MV Input** – Lists all the inputs on the MultiViewer. Fields in this column cannot be edited.
- **Router Output** – In these fields, enter the physical output number of the router that is connected to the MultiViewers input.
- **Router Level** – In these fields, enter the level in the router that the output comes from.
- **Connected** – Untick this field if the associated input does not come from the router.

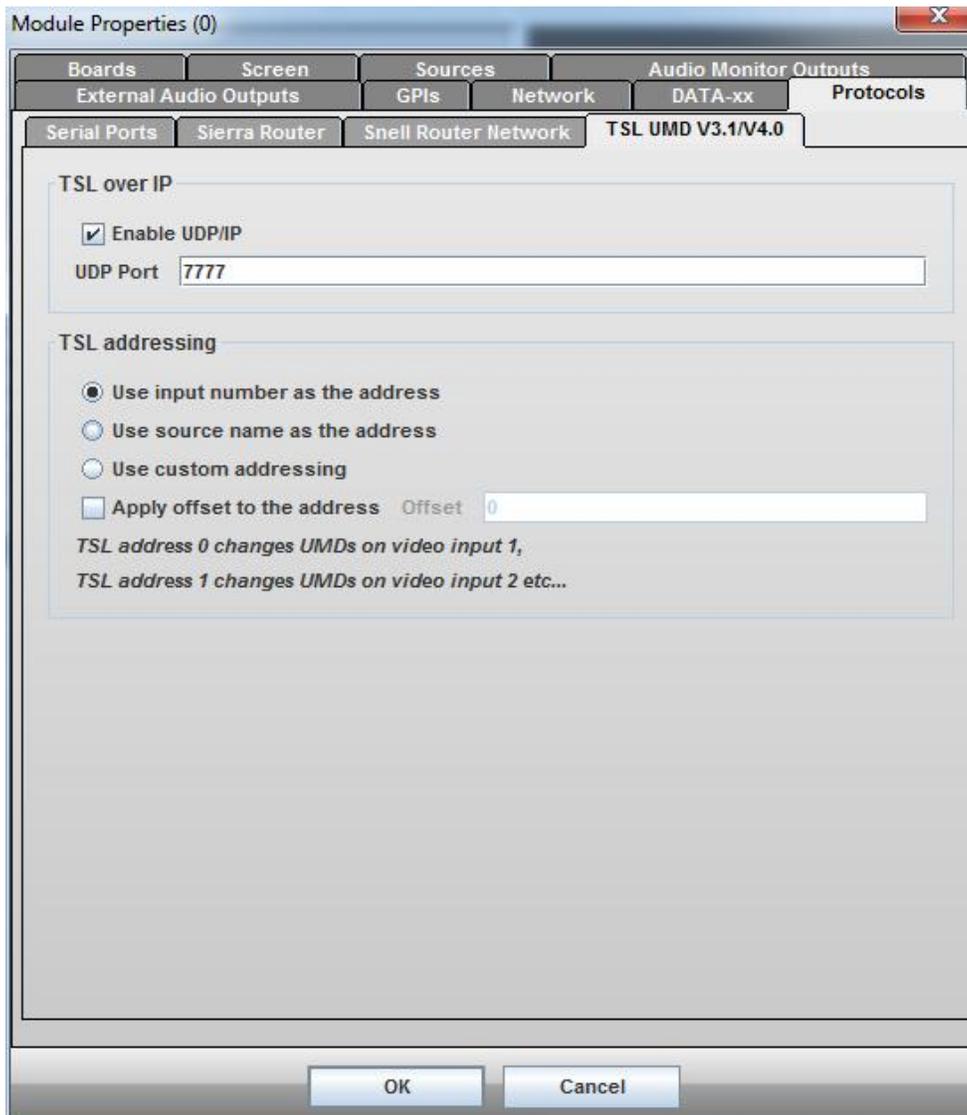
**Enabled** – Allows the MultiViewer to attempt to connect to a Sierra router over Ethernet. (If this is ticked AND the serial port protocol is set to Sierra Router then the Ethernet port wins; the serial port does NOT attempt to connect to a router).

**IP Address** – The IP address of the Sierra router.

**Port** – TCP port to connect to the Sierra router with. Normally a Sierra router uses port 10001, however this can vary.

## SIERRA VIDEO

### Protocols – TSL UMD V3.1/V4.0 Tab



This provides settings for various methods of mapping TSL UMD addresses to sources in the MV, as well as setting up TSL over Ethernet (UDP/IP). The TSL addressing settings apply to both the TSL UMD serial port (if TSL UMD has been chosen as the protocol for the serial port), and the TSL over Ethernet.

#### ***TSL over IP settings***

**Enable UDP/IP:** enable TSL UMD protocol over IP.

**UDP Port:** the UDP port to use.

***TSL addressing settings***

**Use input number as the address:** Maps the TSL UMD address to the MV input number (Note: TSL UMD addresses are 0-based, so if no offset is applied then TSL UMD address 0 maps to MV video source 1; TSL UMD address 1 maps to MV video source 2 etc.)

**Use source name as the address:** This allows each source to be assigned any TSL display address by editing the name of the source (see Module Properties > Sources tab). The name must contain either "UMD" or "umd" followed by a number indicating the TSL address + 1 that affects that UMD. e.g. a source that contains in its name "UMD 1" OR "UMD1" or "umd 1" is modified by TSL address 0 (if no offset is set, as described below).

**Apply offset to the address:** This affects the relationship between TSL UMD addresses and MV inputs (when using the input number as the address), or MV source names (when using source names as the address). The offset can be a positive or negative number.

e.g. 1) When using the input number as the address:

- If the offset is 2 then TSL address 2 changes the UMD on video input 1 (TSL address 0 and 1 do not map to any source). TSL address 3 changes the UMD on video input 2 etc.
- If the offset is -2 then TSL address 0 changes the UMD on video input 3 (MV inputs 1 and 2 are not mapped to any TSL address).

e.g. 2) When using the source name as the address:

- if the offset is 2 then TSL address 2 changes the UMDs on tiles displaying sources containing "UMD1" in their source name.
- if the offset is -2 then TSL address 0 changes the UMDs on tiles displaying sources containing "UMD3" in their source name.

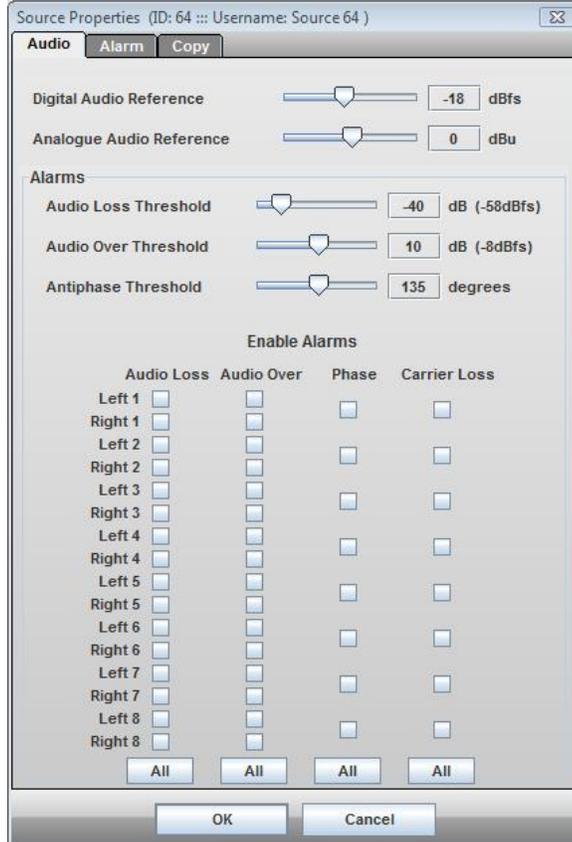
**Use custom addressing:** When this is selected a table appears below it allowing each video input to be mapped to a specific TSL address. It is possible to map multiple inputs to the same TSL address if desirable. To disassociate an input from any TSL address enter -1 as its TSL address. (Note: real TSL addresses range from 0 to 126).

## Source Properties Window

Source Properties for a selected tile can be opened from the *Module > Setup Source* menu, or by double-clicking on a selected source in the source folder.

### Audio Tab

Use this tab to set up audio reference levels and audio alarms associated with a video source.



**Digital Audio Reference** – set the analog to digital reference level when applying an analog meter scale to a digital source, or a digital meter scale to an analog source. It can be set within the range of -30 to -3 dBfs.

**Analog Audio Reference** – set the 0dB reference level with respect to analog meter scales. It can be set within the range of -12dBu to +12dBu.

**Note:** Neither of the reference level adjustments have any effect when digital audio is used with a digital scale.

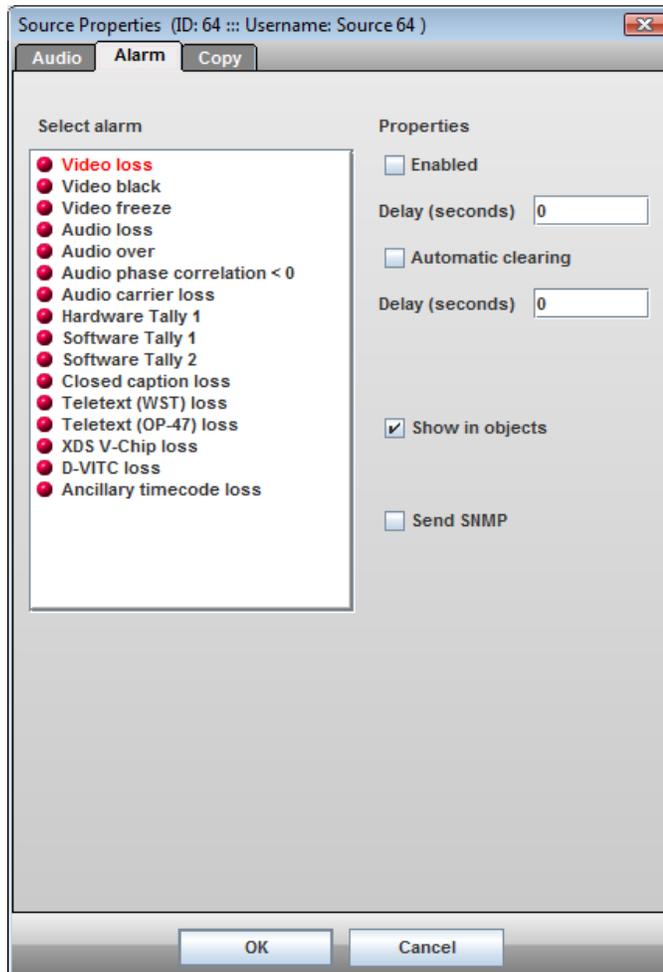
**Alarms group** – here the thresholds for audio loss, audio over, and phase alarms can be set, along with the alarm enabling of individual channels. The 16 channels listed here relate to the 16 embedded audio channels e.g. channels selected under Audio Loss trigger an alarm when the audio level on the associated channel falls below the threshold set above.

## SIERRA VIDEO

**Note:** This only selects which channels are potentially enabled for triggering alarms. The overall alarm type also needs to be enabled in the Alarm tab (see next section) – e.g. the Audio Loss alarm needs to be enabled in the Alarm tab for any of the selected Audio Loss channels to trigger an alarm.

### Alarm Tab

The *Alarm Tab* allows each video and audio alarm to be configured, enabled and displayed.



The properties section of this window allows each alarm to be set individually for onset and auto-clear delay, logging status and visibility in objects and lists.

To select an alarm to configure, click on it in the *Select Alarm* list on the left on the window. The selected alarm appears with its descriptive text highlighted in red. Choose the required properties from the right hand section of the window and check the Enabled box to activate the alarm.

Enabled alarms are shown with a green circle before the descriptive text.

**Select alarm** - Click on one of the alarms listed to change the attributes of it using the controls listed under Properties.

## SIERRA VIDEO

**Enabled** - tick this to enable the selected alarm.

**Delay** - input a delay before the alarm starts.

**Automatic clearing** - check this for alarms that are to be cleared after the *Automatic clearing delay*.

**Automatic clearing delay** - input the automatic clearing delay in seconds.

**Show in objects** - display alarms in objects.

**Send SNMP** - check to send SNMP trap in response to alarm.

### Notes regarding various alarm types:

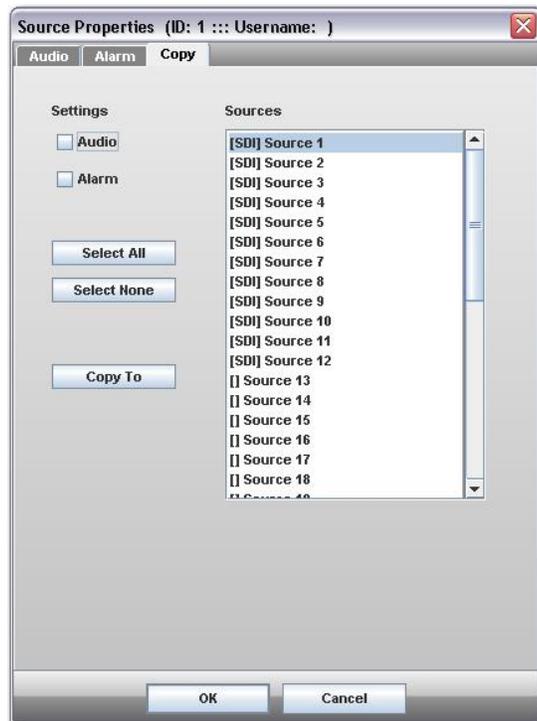
**Closed caption loss:** This alarm activates if closed captions are not present on the expected teletext page or closed captioning display service. e.g. If the teletext is set up to monitor page 801 for captions, and there are no captions on this page then the alarm activates.

**Teletext (WST) loss:** This is only relevant if the source is SD-SDI, and activates if there is no WST present at all (not just the magazine page set up to be monitored).

**Teletext (OP-47) loss:** This is only relevant if the source is HD-SDI, and activates if there is no OP-47 present at all (not just the magazine page set up to be monitored).

**D-VITC loss:** This is only relevant if the source is SD-SDI.

## Copy Tab



**Audio** - check to copy audio settings from selected source/s 1 to 40.

**Alarm** - check to copy alarm settings from selected source/s 1 to 40.

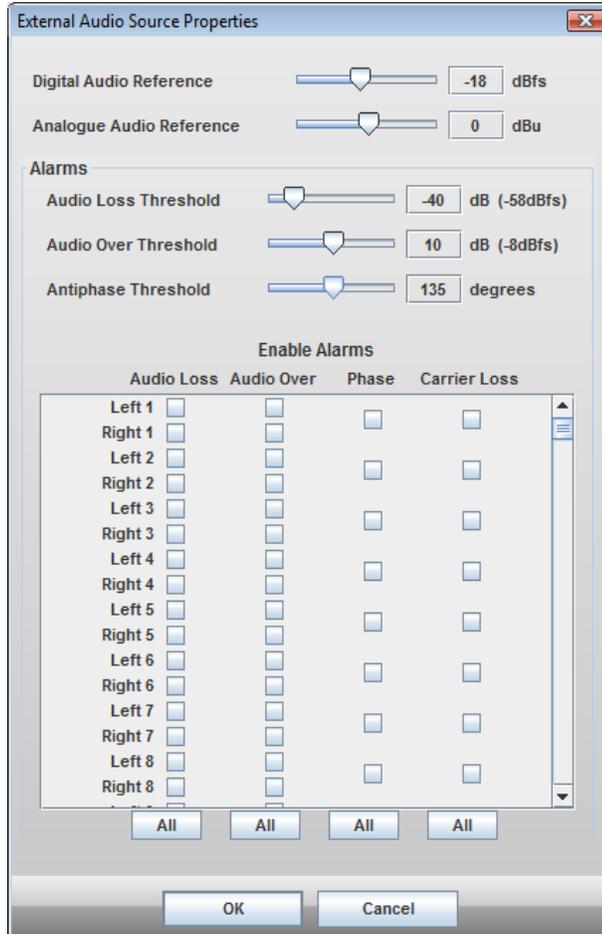
**Select All** - select all sources.

## SIERRA VIDEO

**Select None** - deselect currently selected sources.

**Copy To** - copy settings to selected source/s.

### External Audio Source Properties



External audio inputs can be configured by going to the Module menu and selecting the Setup external audio sources item.

**Digital Audio Reference** – set the analog to digital reference level when applying an analog meter scale to a digital source, or a digital meter scale to an analog source. It can be set within the range of -30 to -3 dBfs.

**Analog Audio Reference** – set the 0dB reference level with respect to analog meter scales. It can be set within the range of -12dBu to +12dBu.

**Note:** Neither of the reference level adjustments have any effect when digital audio is used with a digital scale.

**Alarms group** – here the thresholds for audio loss, audio over, and phase alarms can be set, along with the alarm enabling of individual channels. 256 external audio channels are listed here, regardless of how many external audio input cards are actually

## SIERRA VIDEO

present. e.g. Channels selected under Audio Loss trigger an alarm when the audio level on the associated channel falls below the threshold set above.

**Note:** This only selects which channels are potentially enabled for triggering alarms. For a channel to actually trigger an alarm it needs to be selected as a source in one of the audio meters in a video tile, and the video source associated with that tile needs to have its appropriate audio alarm enabled.

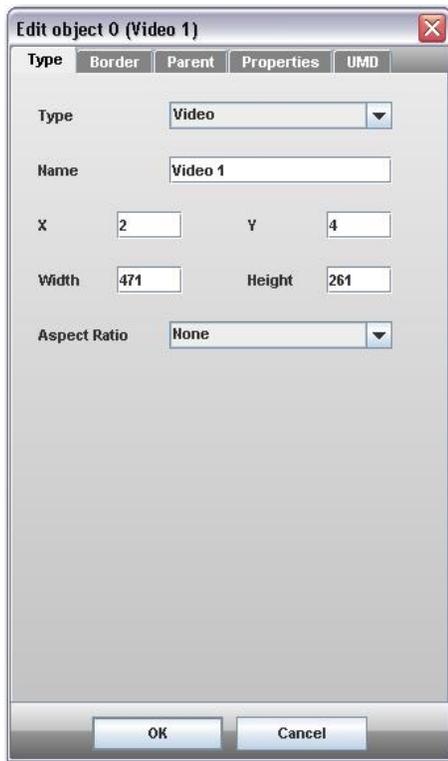
## Edit Object Window

The Edit Object menu is used to set up all the attributes of a tile. It can be opened using two methods:

- **Double-click on the object to edit.**
- **Go to the Object menu and select Edit Object or New Object.**

The *Edit Object* menu comprises 5 tabs: Type, Border, Parent, Properties and UMD. Some controls, such as *Properties*, depend on the type of tile object.

### Type Tab

The image shows a screenshot of a software dialog box titled "Edit object 0 (Video 1)". The dialog has a tabbed interface with five tabs: "Type", "Border", "Parent", "Properties", and "UMD". The "Type" tab is currently selected. Inside the dialog, there are several input fields and dropdown menus. The "Type" dropdown is set to "Video". The "Name" text field contains "Video 1". The "X" coordinate is set to "2" and the "Y" coordinate is set to "4". The "Width" is set to "471" and the "Height" is set to "261". The "Aspect Ratio" dropdown is set to "None". At the bottom of the dialog, there are "OK" and "Cancel" buttons.

**Type** - Defines object type. Choose from None, Video, Audio, Text, Logo, and Clock.

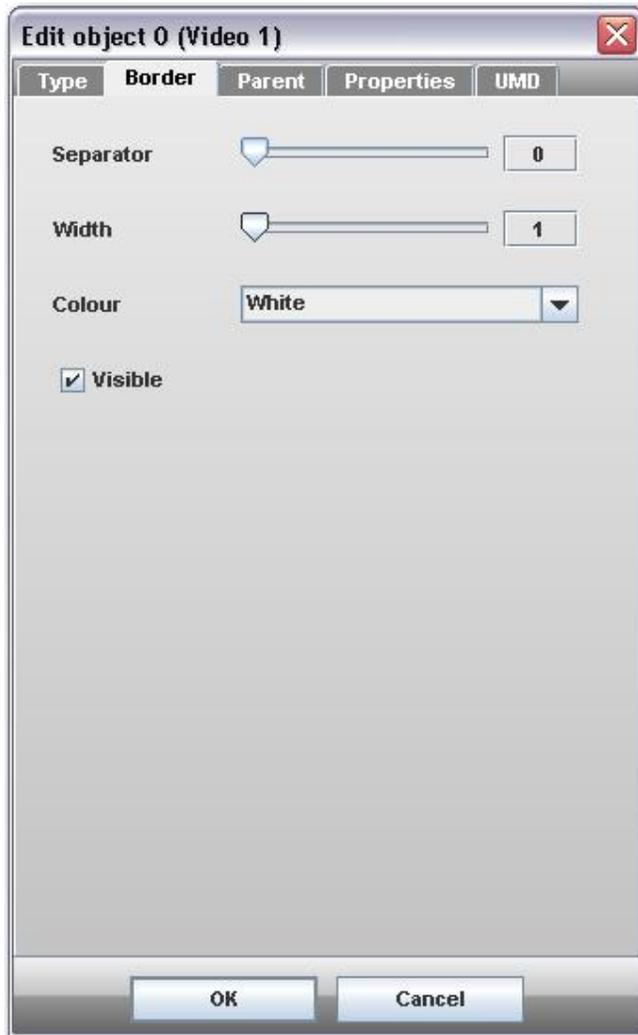
**Name** - Name of the tile, can be up to 40 characters long.

**X, Y, Width, Height** - size and position of the tile can be altered by entering figures here, and any adjustments are reflected in the outline of the rectangles drawn to represent the tiles. Conversely, any resizing or repositioning of the tiles done graphically is reflected in the figures presented here.

## SIERRA VIDEO

**Aspect Ratio** - the aspect ratio can be set to fixed so that as either width or height are changed, height or width, respectively, are automatically adjusted to retain the ratio.

### ***Border Tab***



**Separator** - number of pixels separating the edge of the video content from the tile border.

**Width** - pixel width of the border.

**Color** - color of the border.

**Visible** - turns the border on and off.

### Parent Tab

Assigning a parent object to one or more tiles enables collective positioning and resizing of grouped tiles, which eases the configuration of objects that have a fixed association. Once a tile object has been assigned to a parent, it can no longer be moved independently.



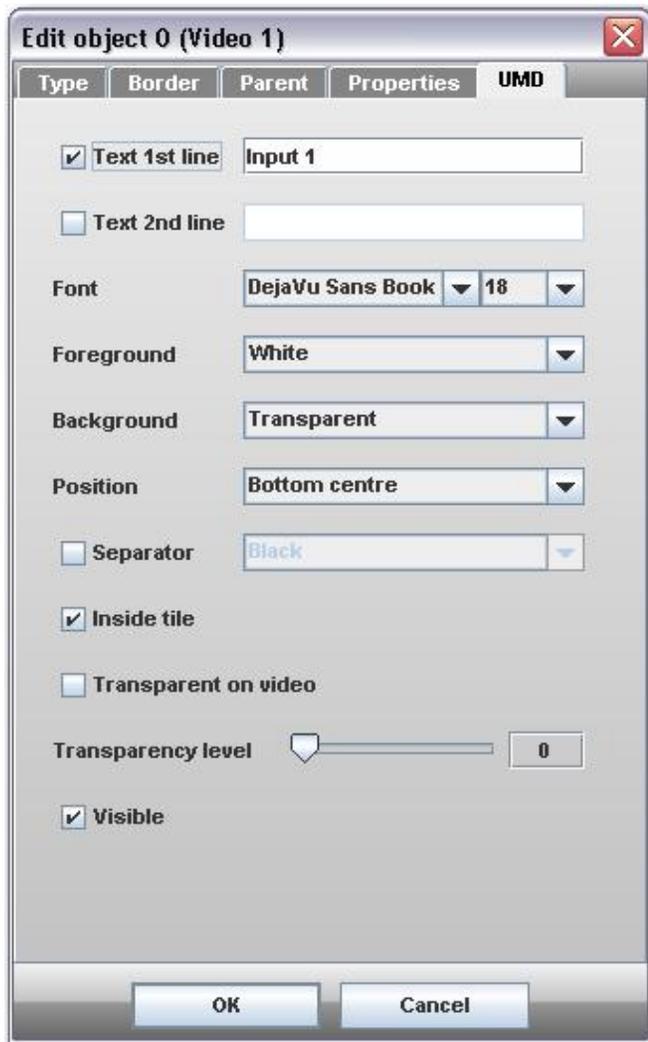
**Name** – for the currently selected tile, select the parent object by name.

**Position** – set the anchor point of the currently selected tile relative to the parent object.

**X Offset / Y Offset** – offset of the anchor point of the currently selected tile relative to the parent object. Note that using a zero offset value causes the tile object to be behind the parent object.

**Lock size** – check to lock the scaling of the currently selected tile to that of the parent object. When this option is selected, the tile object cannot be resized independently.

**UMD Tab**



**Text** - enter UMD text and set it to hidden or visible.

**Font** - choose font and font-size of the text.

**Foreground** - sets the color of the text.

**Background** - sets the color of the UMD background.

**Position** - position of UMD relative to the tile.

**Separator** - places a separator between the UMD and the object's image and also between each line of text. The color of the separator can be chosen.

**Inside** - places the UMD bar inside the tile (within the active picture).

**Transparent on video** - enables the transparency of the UMD when it is in the picture area.

**Transparency level** - sets the transparency of the UMD when it is in the picture area.

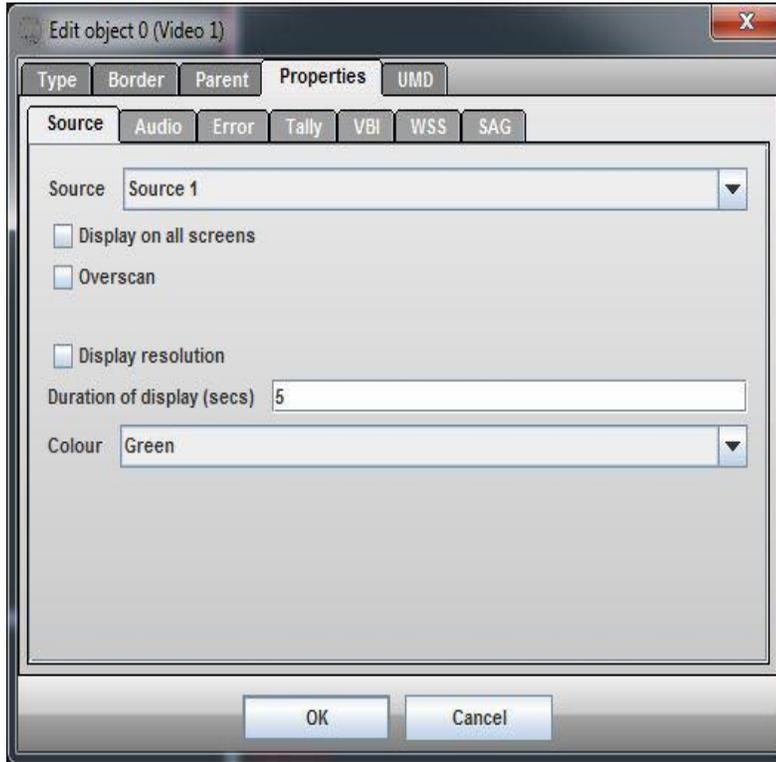
**Visible** - enables / disables the UMD.

### Properties Tab

This tab does not appear if the object type is set to 'None' in the *Type* tab.

For each of the other object type selections, a specific set of controls appears on the Properties tab.

### Source Properties Tab (Video or Audio object)



This tab only exists within the Properties tab of Video and Audio type tiles.

**Source** - for a video tile, selects the source of the video to display in the tile. For an audio tile, it selects the audio channels that have been set up to be associated with the chosen source.

**Display on all screens** –displays the video tile on both outputs. The tiles remain locked to each other on both outputs (moving the tile on one screen also moves it to the same position on the other screen).

**Overscan** – overscan the video image by 5%.

**Display resolution** –displays a message in the top left corner of the tile indicating the format and resolution of the video input.

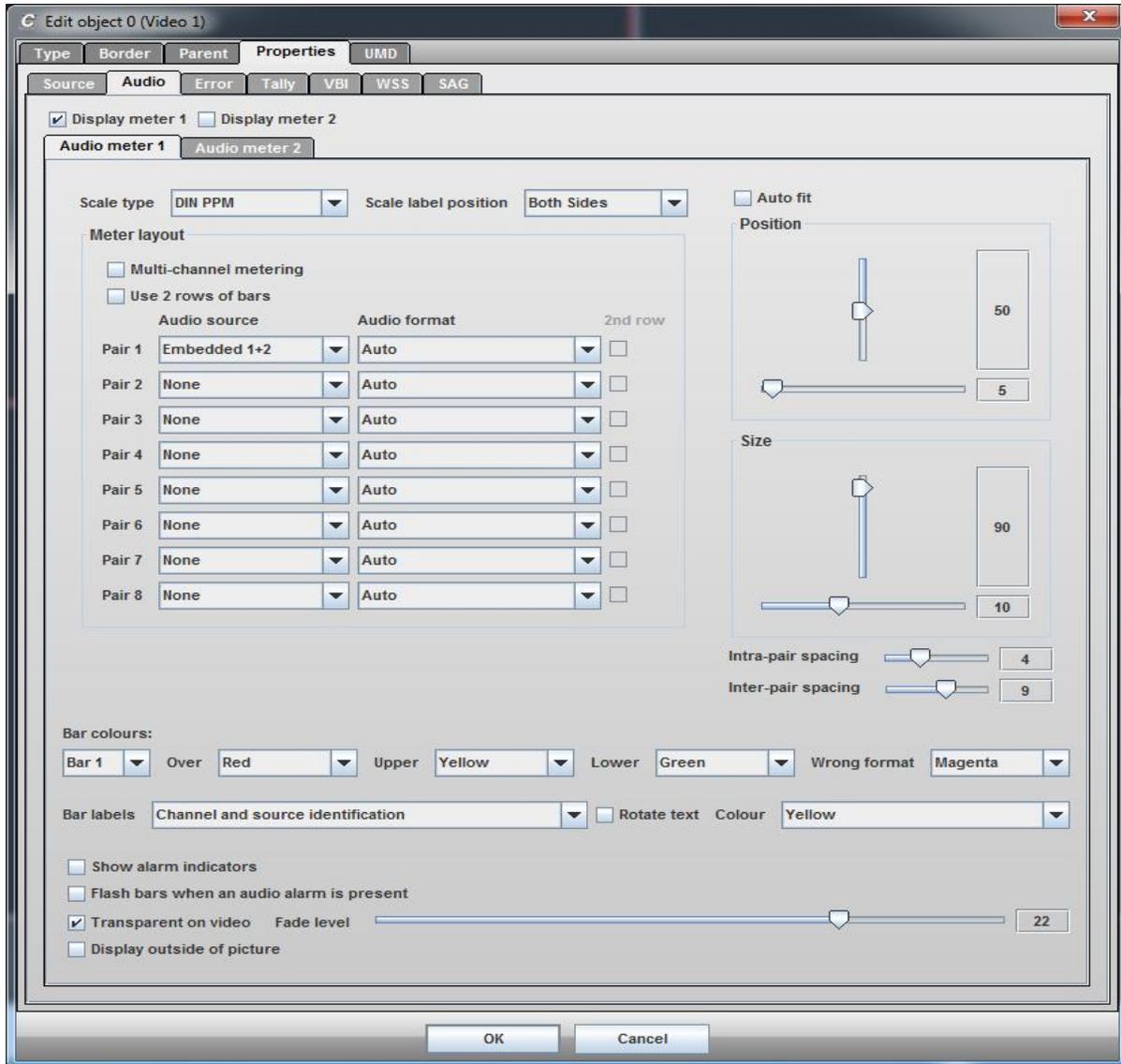
**Duration of display** –sets the number of seconds that the message is displayed after a change in the format or resolution occurs. If there is no video present then the message remains on display (if enabled by the “Display resolution”).

**Color** – sets the color of the video input format message.

## SIERRA VIDEO

### *Audio Properties Tab (Video or Audio object)*

This tab only exists within the Properties tab of Video and Audio type tiles. It controls the audio meters that can be displayed in each window. There can be up to 2 meters per window, each meter controlled by separate sub-tabs within this section.



**Display meter 1 / Display meter 2** - enables / disables each of the 2 audio meter groups.

**Scale type** - sets the scale type of all the audio meter bars on display in this meter.

**Scale label position** - sets the positioning of the scale labelling on either side of the meter.

## SIERRA VIDEO

**Auto fit** - automatically scales the meter to fit into the whole tile. The Position and Size settings are disabled when this is selected.

**Position** - sets the vertical and horizontal position of the meter within the window (disabled when **Auto fit** is ticked).

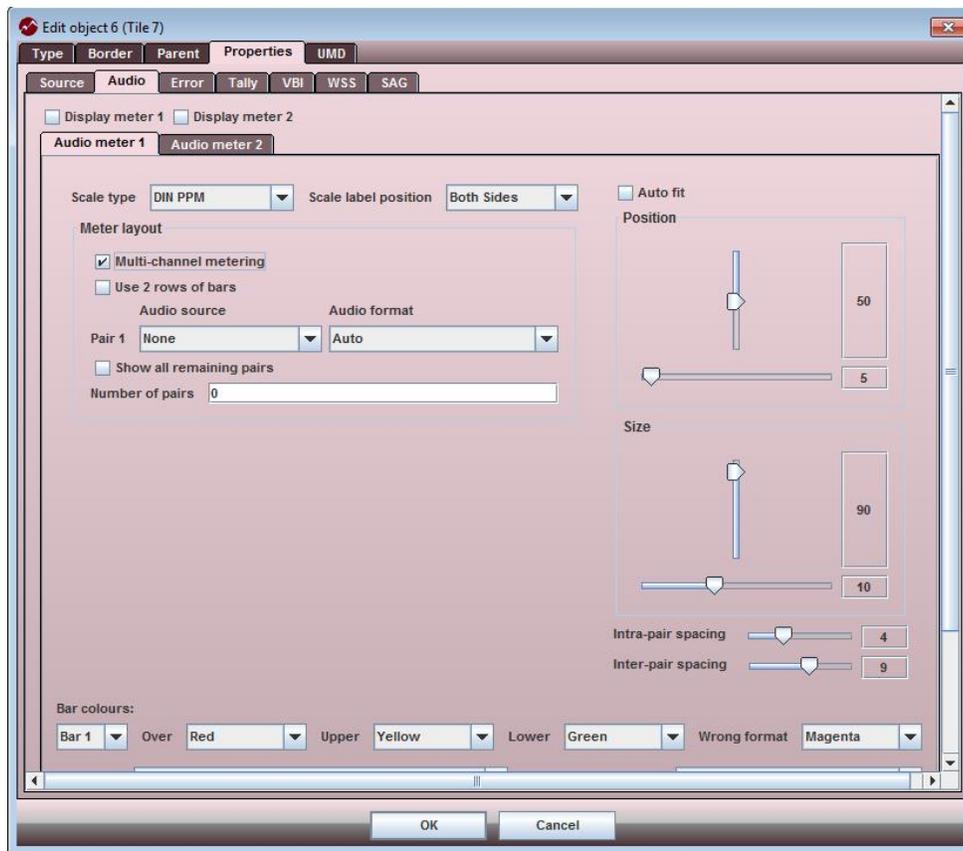
**Size** - sets the vertical and horizontal size of the meter within the window (disabled when **Auto fit** is ticked).

**Intra-pair spacing** - sets the number of pixels appearing between 2 meter bars belonging to the same pair.

**Inter-pair spacing** - sets the number of pixels appearing between 2 adjacent sets of pairs.

### Meter layout:

- **Multi-channel metering** – when this is ticked the Meter layout group changes to the following:



In this mode the first pair to be monitored is selected in the **Pair 1** field and the **Audio format** is then chosen. All subsequent audio pairs then selected use that format setting. The purpose of this is to allow many audio bars to be set up quickly and it is therefore best suited to cases when you want to display many consecutive channels using the same format

The number of pairs that appear in the meter after this first pair is selected by either:

1) Ticking **Show all remaining pairs** - all the pairs that come after the pair chosen in the **Pair 1** field are shown. e.g. If Embedded 8+9 is the pair selected in **Pair 1** then embedded channels 8+9 up to channels 15+16 appear. If External 1+2 is the pair selected in **Pair 1** then all external audio channel appears in the meter.

2) Un-ticking **Show all remaining pairs** and selecting the **Number of pairs** manually. e.g. If Embedded 8+9 is the pair selected in **Pair 1** and **Number of pairs** is set to 2 then embedded channels 8, 9, 10 and 11 appear.

- **Use 2 rows of bars** - when this is ticked, the meter is split into 2 rows, the top row containing the first half of the pairs, the bottom row containing the second half.

**When Multi-channel metering is not ticked:**

- **Use 2 rows of bars** – select this if the meter is to be split into 2 sections. For sources that are to appear in the bottom row, tick the **2<sup>nd</sup> row** box next to the pair setting.
- **Audio source** - sets the source to display in each of the 16 bars of the meter. These 8 fields allow up to 8 pairs to be configured for displaying in any order. Set to None to turn a pair off, or select Embedded or External audio pair as the source.
- **Audio format** – this selects the expected audio format. If set to auto, then the number of bars that actually get displayed for this pair depends on the decoded format. When Dolby E meter segment metadata is the source, there may be up to 8 channels to display for one source pair. If set to a fixed format (PCM, Dolby E 5.1 +2 etc.) then the number of bars displayed is fixed. If the decoded format differs from the one that is set here then the levels will still be displayed (for the appropriate number of channels), however the “wrong format” color is used for the bars. (See **Wrong Color** format setting).
- **2nd row** – see **Use 2 rows of bars** above.

**Bar Colors** - selects the bar number to which the color of the over, upper, lower range, and wrong format applies.

**Over Color** - sets the over range color for the bar selected in the Bar Colors control.

**Upper Color** - sets the upper range color for the bar selected in the Bar Colors control.

**Lower Color** - sets the lower range color for the bar selected in the Bar Colors control.

**Wrong Color** - sets the color used for the bar if the audio format disagrees with the format set in the **Audio format** field.

**Bar labels** - sets the display of the bar labels to either an enumerated format, or the labels as entered for the respective channels, or off. When labels entered for the respective channels is chosen (the **Text** option), it uses the labels entered via the Module > Audio Channel Names menu.

**Rotate Text** - Rotates the label characters by 90 degrees and draws the labels from top down (as opposed to characters being upright and drawn from left to right).

**Color** - sets the color of the bar labels.

## SIERRA VIDEO

**Show alarm indicators** - enables the alarm indicators at the top of the bars.

**Flash bars when an audio alarm is present** – enables the flashing of the audio bars when an audio alarm is detected, (to attract attention).

**Transparent on video** - enables the transparency of the meter bars when they are on the in-picture area.

**Fade level** - sets the transparency of the audio bars when they are on the in-picture area.

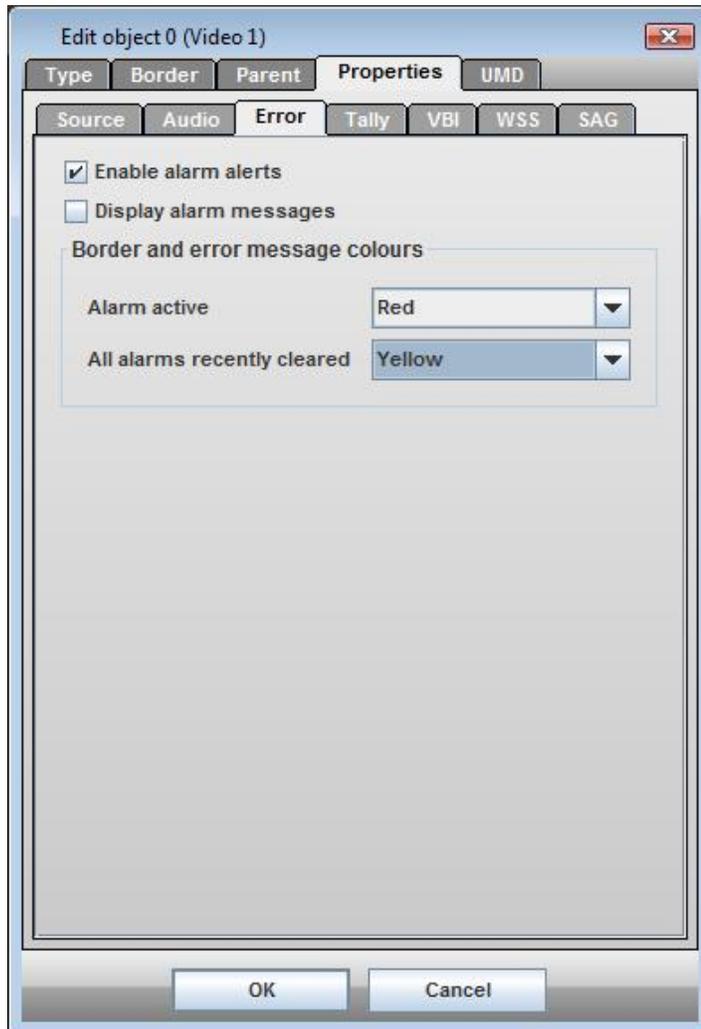
**Display outside of picture** - reduces the width of the video portion of the tile and positions the meter against the inner edge of the tile so that it is not overlapping the video. (**Note:** to maintain the desired aspect ratio of the video, go to the WSS tab, select WSS/AFD for the mode, tick the Auto size video image, and set the Default aspect ratio to the applicable value).

**Note:** The number of bars that actually get displayed in each meter depends on the number of channels contained in a pair. When Dolby E meter segment metadata is the source, there may be up to 8 channels to display for one source pair.

**Note:** No decoding of Dolby E audio content is carried out. Only the meter level information contained in the meter segment of a Dolby E frame is used for metering.

*Error Properties Tab (Video or Audio object)*

This tab only exists within the Properties tab of Video and Audio type tiles. It determines the behaviour of the tile when one of its enabled alarms gets triggered.



**Enable alarm alerts** - must be ticked if any of the alarm indications (alarm messages or flashing border) are to be shown in the tile.

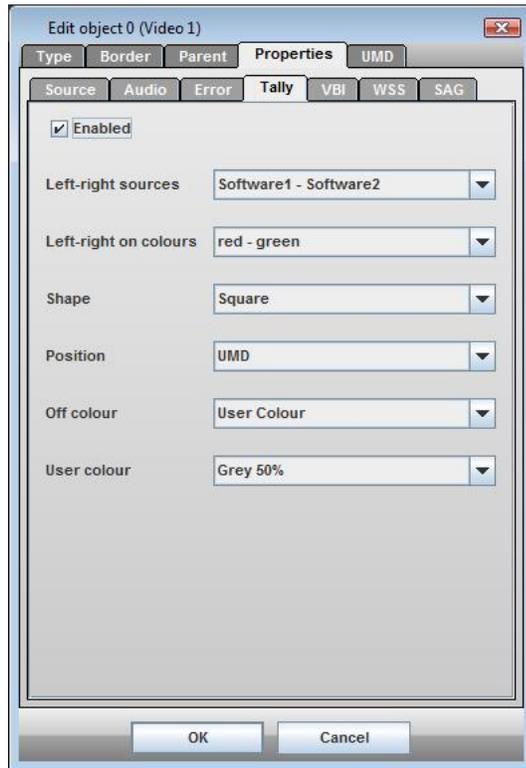
**Show alarm name** - when ticked, all the alarms that are currently triggered or have recently been cleared are displayed in the tile. Only one alarm type gets displayed at a time; it cycles through them if multiple alarms are present.

**Alarm active** - sets the border color of the tile when an alarm triggers. Also applies to the color of alarm messages for alarms that are active.

**All alarms recently cleared** - sets the border color of the tile when no alarms are currently triggered, but some have recently cleared but not reset yet. (See alarm section on the automatic reset timeout period). This also applies to the color of alarm messages for recently cleared alarms.

*Tally Properties Tab (Video object)*

This tab only exists in tiles that are of Video type.



**Enabled** - turns the display of the tally on / off.

**Left-right sources** - select hardware, or one of two software tallies. The hardware tally is the GPI tally that has been set up for the video source of the tile. This GPI to source assignment is configured in the GPI Inputs panel (in menu Module > Setup Module, then in the Module Properties window, in the GPIs tab, GPI Inputs tab. For each applicable GPI, select a Source ... Hard Tally here).

The two software tallies operate in accordance with TSL protocol. This has up to 127 display addresses; each address comprising 4 tallies and a UMD. The address assigned to a source depends on how the TSL protocol has been configured (see **TSL Protocol Options**). Each video window can use the first 2 tallies of its display address to trigger the 2 tallies available in its UMD bar, or the border tally if set up appropriately.

**Style** - select red-green, green-red, red-red and green-green.

**Shape** - select fill, square or round.

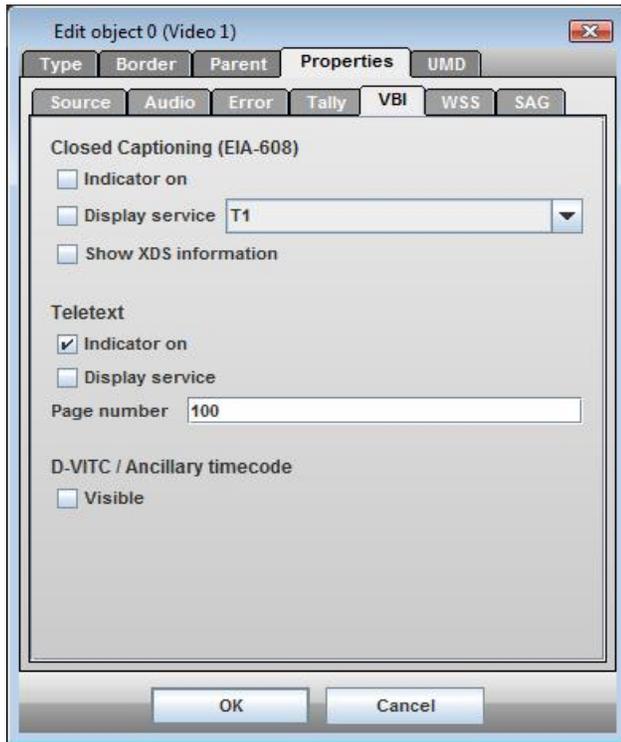
**Position** - select UMD, border or UMD and border.

**Off colour** - sets the disabled color to either default disabled color, UMD color, border color, or the user selected color set in the box below this control

**User Color** – To set the user-selected colour.

*VBI Properties Tab (Video object)*

This tab only exists in tiles that are of Video type.



**Closed Captioning (EIA-608):** These settings apply to composite NTSC input only (line-21 closed captions).

- **Indicator on** - enables a “CC” indicator to be shown in the tile if the selected closed caption type is present.
- **Display service** - displays the closed caption text in the tile if ticked, and selects the type of service to be displayed.
- **Show XDS information** - shows the information contained in the extended data services.

**Teletext:** These settings apply to composite or SDI video that contains WST subtitles, and SDI video that contains OP-47 teletext subtitles.

- **Indicator on** - enables the indicator to be shown if teletext is present in the video. (Displays “WST” or “OP-47”, depending on the type present, or no indicator if none present).
- **Display service** - displays the teletext page or subtitles from the selected page number in the tile if ticked.
- **Page number** - selects which teletext page is to be viewed.

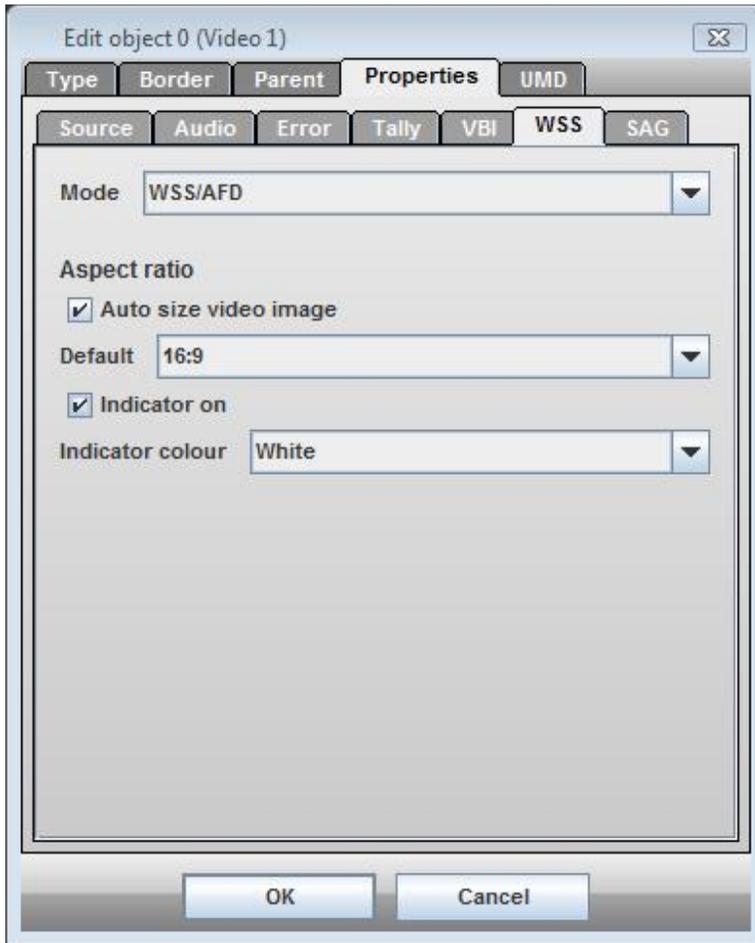
**D-VITC / Ancillary timecode:**

- **Visible** - enables the display of the vertical interval timecode (D-VITC or ATC). This is only available on SDI inputs.

## SIERRA VIDEO

### *WSS Properties Tab (Video object)*

This tab only exists in tiles that are of Video type.



**Mode** - selects the type of WSS / AFD to decode.

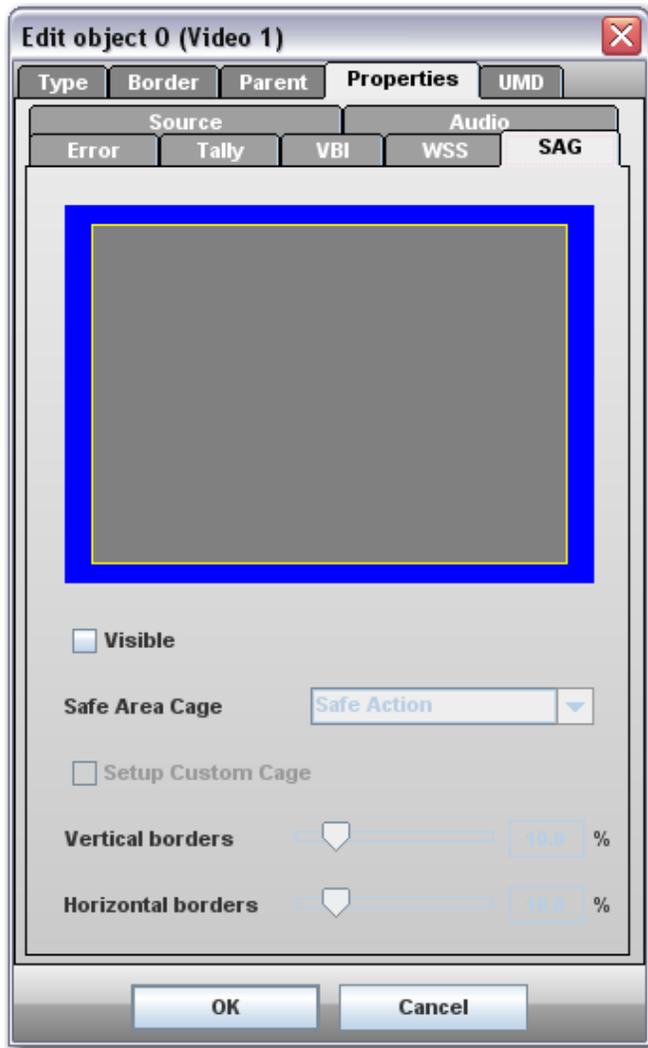
**Aspect Ratio, Auto size** - when ticked, the aspect ratio of the video automatically responds to any changes in the selected WSS or AFD information.

**Aspect Ratio, Default** - chooses the aspect ratio to use when the correct one is unknown (for example if WSS or AFD is not present).

**Aspect Ratio, Indicator** - when ticked, this presents an indicator in the tile if there is aspect ratio information available.

**Indicator color** – color of the indicator text.

*Safe Area Generator Tab (Video object)*



**Visible** - when ticked, this shows the safe area outline in the video.

**Safe Area Cage** - if a preset safe area cage is to be shown then choose the appropriate one from this list.

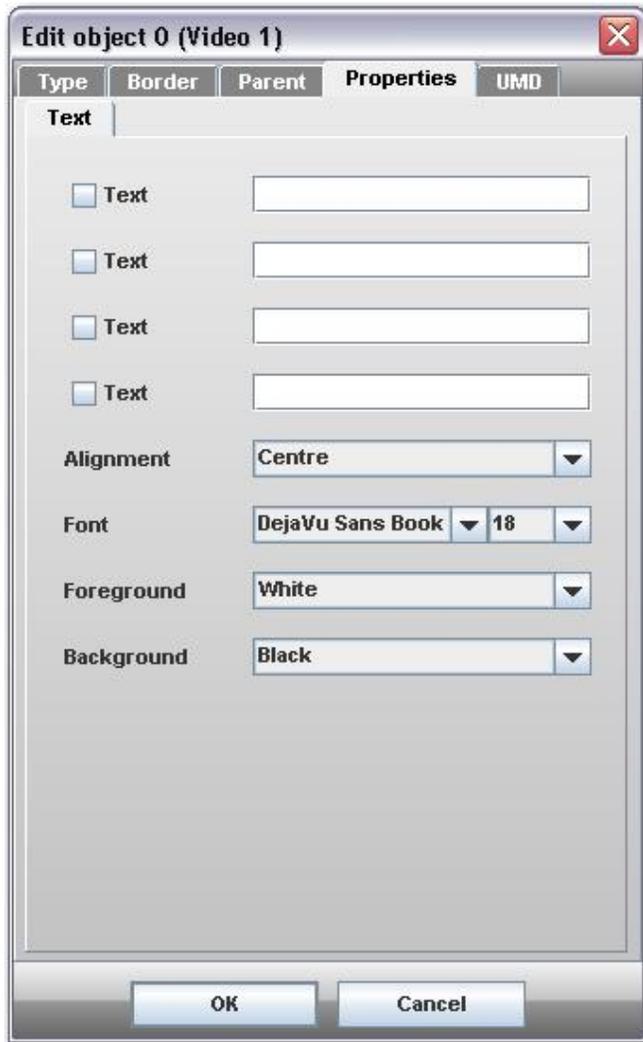
**Setup Custom Cage** - when ticked, a custom sage area cage can be drawn using the vertical and horizontal border controls.

**Vertical Borders** - adjust the vertical borders of the safe area. The slide bar can be used, or numbers manually entered.

**Horizontal Borders** - adjust the horizontal borders of the safe area. The slide bar can be used, or numbers manually entered.

### ***Text Properties Tab (Text object)***

This tab only exists in tiles that are of Text type.



**Text** - enter up to four lines of text and set it to hidden or visible.

**Alignment** - justify text within the tile.

**Font** - select font and point size.

**Foreground** - set text color.

**Background** - set text background color.

***Logo Properties Tab (Logo object)***

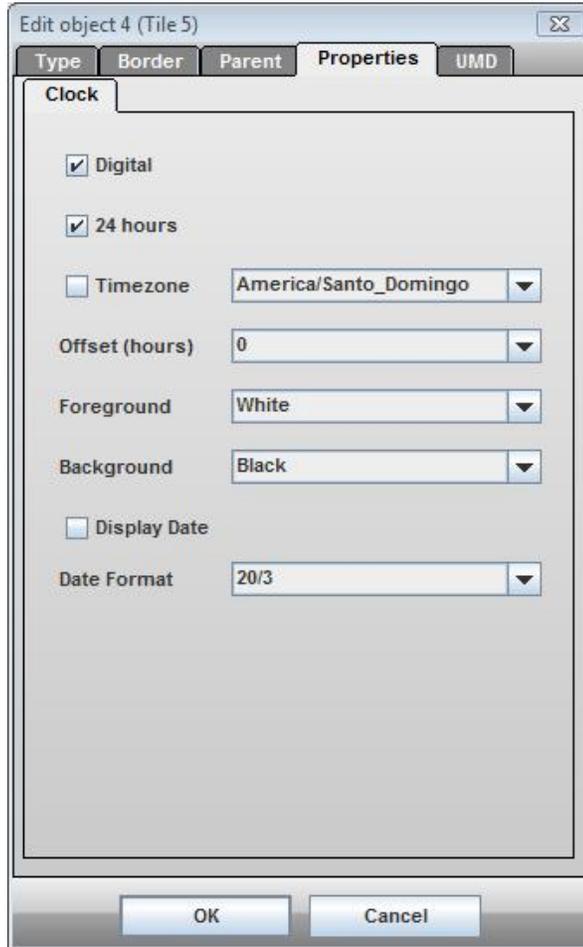
This tab only exists in tiles that are of Logo type.



**File name** – select one of the stored logo files.

### ***Clock Properties Tab (Clock object)***

This tab only exists in tiles that are of Clock type.



**Digital** - check for digital clock type, uncheck for analog type.

**24 hours** - check for 24 hour clock (applicable to digital clock type only).

**Timezone** - check to set clock time to GMT, or within the range of GMT -1 to GMT +12.

**Offset (hours)** - applies offset from -12 to +12 hours (works in combination with Timezone setting, if checked).

**Foreground** - set the clock color (digital clock only).

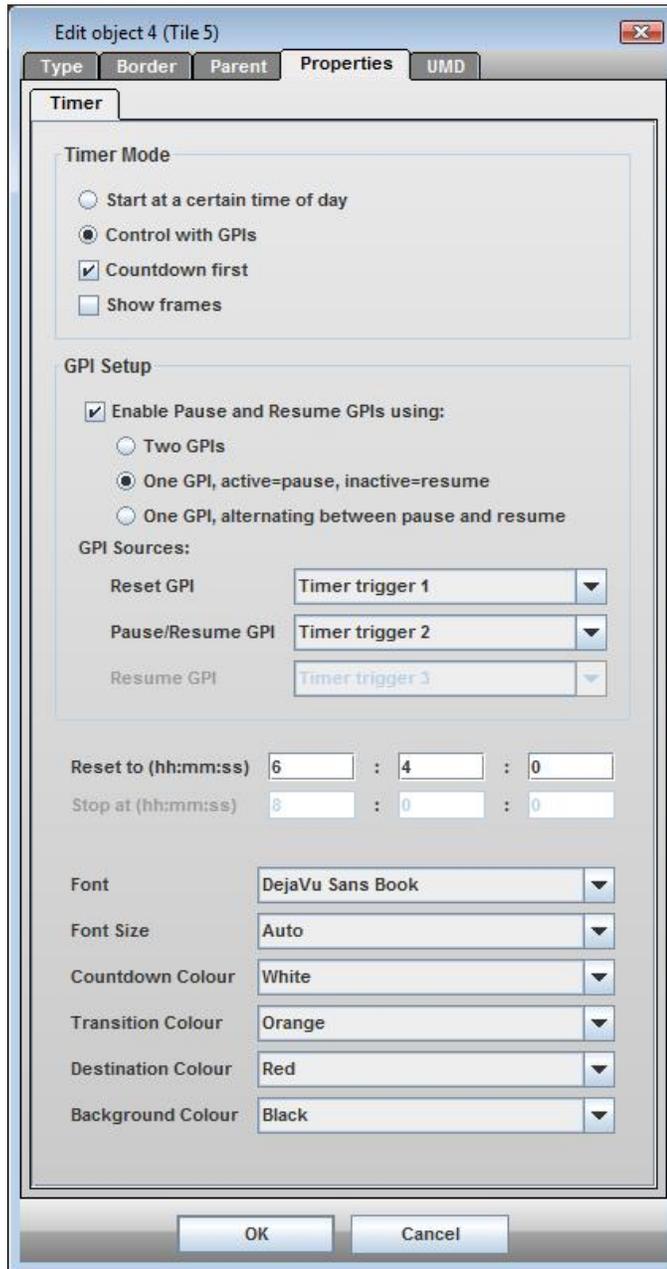
**Background** - set the clock background color (digital clock only).

**Display Date** - check to display today's date as well (applicable to digital clock type only)

**Date Format** - sets the format of the date when displayed (applicable to digital clock type only)

### Timer Properties Tab (Timer object)

This tab only exists in tiles that are of Timer type.



#### Timer Mode:

- **Start at a certain time of day** triggers the timer at a particular time of day. The time of day to start is entered in the **Start at** field (in the above figure this is the **Reset to** field, but it changes to **Start at** when **Start at a certain time of day** is selected).
- **GPI Input** allows the timer to be controlled by GPIs.

## SIERRA VIDEO

- **Countdown first** - If the trigger mode is **Time of day** then while the time of day is earlier than the start time, the timer counts down the time remaining before the start time if countdown is ticked. If **Countdown first** is not ticked then the timer displays 00:00:00 during this period preceding the start time.

If the timer is controlled by GPIs then when the GPI starts the timer it starts counting down from the time entered in the **Reset to** field. If **Countdown first** is not ticked then the timer starts counting up from the start time when the GPI triggers it.

- **Show frames** - Display the frames as well. If this is not ticked the display format is hh:mm:ss. If ticked then the display format is hh:mm:ss:ff. The frames per second count is determined by the video output frame rate.

**GPI Setup:** This is only applicable if **Control with GPIs** is ticked above.

- **Enable pause and resume GPIs using:** Tick this to allow the timer to be paused and resumed with GPIs.
  - **Two GPIs:** In this mode two separate GPIs need to be set up for the pause and resume functions.
  - **One GPI, active=pause, inactive=resume:** In this mode there is only one GPI used for controlling pause and resume. When the GPI is active (switched to 5V), the timer pauses. When inactive (not switched to 5V) the timer resumes.
  - **One GPI, alternating between pause and resume:** In this mode there is only one GPI. If the timer is currently running then triggering the assigned GPI pauses the timer. If the timer is currently paused then triggering the assigned GPI restarts the timer.
- **GPI Sources:** This assigns the GPIs to use for each function in this timer. These are not the physical GPIs – they are GPIs named **Timer Trigger 1** to **Timer Trigger 10**. The actual assignment to physical GPI inputs needs to be configured in the GPI Input setup panel, under Module Properties (Module menu -> Setup Module -> GPIs tab -> GPI Inputs tab. For the physical GPI inputs that are to be used, select unique timer triggers here. e.g. for Global GPI In 1, 2, and 3, select Timer 1 trigger, Timer 2 trigger, and Timer 3 trigger. Then, in the Timer Tile properties, these 3 timer triggers can be assigned to the reset, pause and resume functions.

**Start at (Reset to)** - If the timer mode is **Time of day** then the **Start at** time determines the time of day that the timer starts counting upwards. If the timer mode is **Control with GPIs** then when the timer is reset by the GPI it starts counting up to, or down from, the start time set.

**Stop at** - If the timer mode is **Time of day** then this determines the time of day that the timer stops. The stop time is not applicable when controlled by GPIs.

**Font, Font Size** - The font to use for the digits. If the size is set to auto then the digits are sized to fit in the window, up to a certain maximum font size.

## SIERRA VIDEO

**Countdown Color** - For time of day triggering this is the color of the timer digits before the start time is reached. For GPI triggering this is the color of the timer digits while the GPI has not triggered the timer, and while it is counting down.

**Transition Color** - For time of day triggering this is the color of the timer digits for the 10 seconds before the start time is reached. For GPI triggering, if the timer is only set to count up then this is not applicable. If it is set to count down first then it changes to the transition color for the 10 seconds before it reaches 0.

**Destination Color** - For time of day triggering, this is the color of the timer digits while the time of day is in between the start time and stop time. For GPI triggering this is the color of the timer digits after it has finished counting down (or if not set to count down then it is the color that the timer changes to as soon as the GPI triggers it).

**Background Color** - Color of the filled background.

### Examples:

- *Trigger the timer to start at 10.00am and stop at 10.30am, and countdown beforehand.* Set the mode to Time of day; start and stop times to 10:00:00 and 10:30:00 respectively. Tick the countdown box. If the current time is 9:45am then the timer now displays 00:15:00, and is counting down. It is currently white, assuming the default colors displayed above are set. When the time of day is 10 seconds before 10am the timer changes color to orange and displays 00:00:10. When 10am is reached it switches to red and starts counting up from 00:00:00. When 10:30am is reached it displays 00:30:00. Immediately after that it changes back to white and starts counting down from 23:30:00 – the amount of time remaining before 10am the next day.
- *Trigger the timer by a GPI, and allow it to be paused and resumed using individual GPIs. Initially it is to countdown from 00:00:30.* First, 3 GPIs have to be assigned as a timer triggers. In the **Module Menu | Setup Module**, go to the **GPIs** tab, and then **GPI Inputs** sub-tab. On the 3 GPIs that are to be used click on the drop-down list and select the **Timer 1 trigger** item for one, **Timer 2 trigger** item for another and **Timer 3 trigger** item for the third. Press OK to close this GPI window. Open the Object Properties of the Timer tile, and in the Properties tab set the **Trigger Mode to Control with GPIs**. Tick the **Enable Pause and Resume GPIs** box, select **Two GPIs** (for pause and resume), and in the **GPI sources**, select **Timer trigger 1, 2, and 3** for the 3 types of GPIs. Set the **Reset to** time to 00:00:30 and tick the **countdown first** box. The timer can be started initially with either the reset or resume GPI. It starts counting down from 00:00:30, and is colored white. When it reaches 00:00:10 it changes to orange. 10 seconds later it reaches 0, changes to red, and starts counting up. The timer continues to count upwards indefinitely, wrapping back to 00:00:00 after 24 hours. At any time the pause and resume GPIs can be activated. Any further assertions on the reset GPI resets it back to 00:00:30, and it immediately starts counting down again if currently running, or remain at 00:00:30 if currently paused, until it is restarted.

## Uploading Files

### Graphics Files

Graphics files may be uploaded to the frame and assigned as tile objects for display. They might be used for channel identification purposes. Approximately 200MB is available for bitmaps and any number of bitmaps may be uploaded as long as this limit is not exceeded.

Graphics files to be stored in the frame must be in the .png format. Uploading the files is performed using a PC connected to the RMP-MVC connector panel LAN port directly, or over a network.

- 1) Establish communication with the MV frame by using Windows Explorer to search for the IP address of the frame: <ftp://192.168.0.120>, or whatever the current IP address is set to.
- 2) Right click in the right hand side of the Windows Explorer page and select 'Login As...'. The FTP server Log On As window appears. Log in with the user name 'root', using the password 'smv'. The complete list of currently loaded files is revealed.
- 3) Copy the graphics file or files to the clipboard and paste them into the right hand side of the Windows Explorer page.
- 4) The file transfer begins.
- 5) When the upload is complete, restart the browser to update the file list.

### Configuration Files

Configurations are saved as .xml files. Any that have been saved appears within the list of files that are revealed when logging into the MV, in the layouts directory (as described above). From here, they may be copied and saved to a PC for upload to another MultiViewer. The upload procedure is identical to that used for uploading graphics files.

---

**Note:** The IP addresses of the frame and the PC must be in the same range. IP settings can be configured from the front panel OLED menu, or via the LAN using the MultiViewer web interface.

## Upgrading Firmware

From time to time, firmware updates may be made available. The current firmware status of the MultiViewer can be checked in the browser interface Help / About menu.

---

**Note:** As well as accessing the MV GUI, the LAN port on the **RMP-MVC** connector panel is used to update the firmware on the MPX-MVC card **AND** the cards that it manages (e.g. VIP, AIPxxx etc.) The MPX-MVC card updates these as necessary after its own firmware is updated. The MPX-MVC card does **NOT** update the MPX-NET main card. The LAN port on the **RMP-NET** connector panel needs to be used to update the MPX-NET card.

## SIERRA VIDEO

Hence, to update both the MPX-MVC and MPX-NET main cards, access to both ports is required, either via two separate connections or by updating each card in turn.

A more detailed example of **updating firmware on the NET and MVC cards** is given in **Appendix D** at the back of the manual.

Uploading new firmware files is easily performed using a computer connected to either the RMP-MVC or RMP-NET LAN ports directly, or over a network.

- 1) Establish communication with the MV frame to be upgraded by using Windows Explorer or a FTP client such as WinSCP to search for the IP address of the card being updated. You then need to identify the IP address for each card you are going to update. The MV is supplied with the following factory default IP addresses:

**MPXNET** card: 192.168.0.**120**.

**MPXMVC** card: 192.168.0.**121**

**The IP addresses of the frame and the computer must be in the same range.**

If necessary, the IP addresses of the MPX-NET and MPX-MVC cards can be changed using the front panel OLED display.

- 2) The FTP client username is **root**, password is **smv** for either card.
- 3) Transfer the **mpxnet...** file to the IP address of the **MPX-NET** card by copying and pasting the file into the ftp page.  
Transfer the **mpxmvc...** file to the IP address of the **MPX-MVC** card by copying and pasting the file into the ftp page.
- 4) **WAIT FOR AT LEAST 10 SECONDS AFTER A FILE TRANSFER HAS COMPLETED. If the power is switched off before this period then the file may not have completed saving on the card and the update does not proceed when rebooting.** The GUI can be used to reboot the MPX-MVC card, but if the MPX-NET card has been updated, the MV **must** be power cycled.
- 5) After the front display exits its **BOOTING...** indication, it says **UPDATING FIRMWARE**. It remains in that state for a few minutes. After that it should say **DETECTING HARDWARE**, and it takes another few minutes before the update has completed and any video appears on the output.
- 6) Using **Help>About** on the GUI then shows the current firmware release on either card. Check that the version(s) are the expected ones (the version of the firmware must agree with the version embedded in the name of the file uploaded. e.g. MVC filename is typically of the format; **mpxmvc-inst-mv-1.0.37.tar.bz2**. In this example the version is 1.0.37).

# Communication Protocols

## Open “Hydra” Protocol

### Introduction

The MV contains a selection of commands that can be used for adjusting certain settings remotely. This protocol uses XML to control certain features of the MV in a user-friendly way, either over Ethernet / IP or through the serial port.

### Formatting

All messages sent to and received from the MV use XML formatting, with each message enclosed in the tag XML. The first element inside the XML tag is always PACKET. The structure is always of the format:

```
<XML>  
<PACKET MODULE="MV" VERSION="1.0">  
...  
</PACKET>  
</XML>
```

The MODULE and VERSION attributes in the PACKET element are optional. The response to this is the same.

### Connections

The Open Protocol has two types of connections – one for transactions and one for event handling. However, currently the MV only supports transaction types. The normal procedure for sending transactions by Ethernet is:

- Connect using TCP port 8881 to the MV
- Send a transaction as XML formatted text
- Receive the result of this transaction as XML formatted text

## SIERRA VIDEO

- Repeat this procedure for further transactions. The connection can be kept open for as long as necessary.
- Close the socket when finished.

The procedure for sending transactions using the serial port is the same, except that the TCP socket connection is not applicable.

If the serial port is to be used then the MV's serial port needs to be configured to use the Open Protocol option in the Module menu -> Setup Module -> Protocols tab. For controlling over Ethernet, no configuration needs to be done – the MV is always listening on port 8881 for a connection to be established.

## Transactions

A transaction contains a number of commands to be executed by the MV. It sits inside a PACKET tag and has the following format:

```
<TRANSACTION SERIAL="serial" MODE="mode">
```

```
...
```

```
</TRANSACTION>
```

serial is a unique string to identify each transaction. The MV uses it in the reply to the transaction. mode is ignored by the MV and is not essential (it is just present to comply with the format of the Open Protocol).

The result of a transaction is always sent with the following tag:

```
<TRANSACTIONRESULT SERIAL="serial" ERROR="error">
```

serial is the same string that was used in the TRANSACTION's SERIAL attribute that was originally sent to the MV, and error is the number of commands that have failed due to errors in the command sent. Within this transaction response, the command results are stored in the same order that they were sent in the original transaction.

## Commands

Each command sits inside a TRANSACTION tag and is of the following format:

```
<COMMAND ID="name" SERIAL="serial">
```

```
...
```

```
</COMMAND>
```

name is the name of the command and serial is a unique string that the MV uses in the command's transaction result. The result of a command sits inside a TRANSACTIONRESULT tag and is of the following format:

```
<COMMANDRESULT SERIAL="serial" ERROR="error">
```

```
...
```

```
</COMMANDRESULT>
```

error is 0 if the command was successful, non-zero if not successful. serial is the serial string that was supplied in the original COMMAND transaction.

In summary, the complete format of a command transaction XML document is:

```
<XML>
```

```
<PACKET MODULE="MV" VERSION="1.0">
```

```
<TRANSACTION SERIAL="serial" MODE="mode">
```

```
<COMMAND ID="name" SERIAL="serial">
```

```
...
```

```
</COMMAND>
```

...more <COMMAND> and </COMMAND> tags if more than one command is to be sent

```
</TRANSACTION>
```

```
</PACKET>
```

```
</XML>
```

...and the complete response is:

```
<XML>
```

```
<PACKET MODULE="MV" VERSION="1.0">
```

```
<TRANSACTIONRESULT SERIAL="serial" ERROR="error">
```

```
<COMMANDRESULT SERIAL="serial" ERROR="error">
```

```
...
```

```
</COMMAND>
```

...more <COMMANDRESULT> and </COMMANDRESULT> tags if more than one command was sent

```
</TRANSACTIONRESULT>
```

```
</PACKET>
```

```
</XML>
```

## Command Summary

The commands currently available are listed in the table below.

Command	Description
adjustbackground	Updates the background of an object
adjustborder	Updates the border of an object
adjusttext	Updates the lines in a text object
adjustumd	Updates the UMD text in an object
hidetext	Hides a text object
getsourcetally	Gets the state of a tally for a source
getversion	Gets the version of firmware running
loadlayoutandupdate	Load a layout and send it to the screen
setaudiomonitorsource	Set the source of an audio monitor output
setaudioembeddedsources	Set the source of an embedded audio output
sethdcp	Enable / disable HDCP
setobjectsource	Set the source of a video object
setsourcenam	Sets the name (UMD) for a source
setsourcetally	Sets the state of a tally for a source

## Object Related Commands

These commands adjust the settings of objects (tiles). In general, an object is referenced by its username. i.e. In the examples given below, a line such as:

```
<OBJECT ID="object1">
```

is referencing the object(s) that has the username "object1".

### Adjust UMD

Adjust the UMD text of an object

<b>Send</b>	<pre>&lt;COMMAND ID="adjustumd" SERIAL="example"&gt; &lt;MODULE ID="module1"&gt; &lt;OBJECT ID="object1"&gt; &lt;LINE ID="0"&gt;Line1&lt;/LINE&gt; &lt;LINE ID="1"&gt;Line2&lt;/LINE&gt; &lt;/OBJECT&gt; &lt;OBJECT ID="object2"&gt; &lt;LINE ID="1"&gt;Text&lt;/LINE&gt; &lt;/OBJECT&gt; &lt;/MODULE&gt; &lt;/COMMAND&gt;</pre>
<b>Receive</b>	<pre>&lt;COMMANDRESULT SERIAL="example" ERROR="0"&gt; &lt;/COMMANDRESULT&gt;</pre>

For each object, specify the module name (currently ignored by the MV), object name (the username given to the object), line number in the UMD (0 or 1), and text for the UMD line. It is volatile, meaning that it only remains applied to the UMD while the current layout remains on screen. Uploading a new layout or even uploading the current layout again overwrites the UMD with the text stored in the layout.

### Adjust Border

Adjust the border color of an object

<b>Send</b>	<pre>&lt;COMMAND ID="adjustborder" SERIAL="example"&gt; &lt;MODULE ID="module1"&gt; &lt;OBJECT ID="object1"&gt;green&lt;/OBJECT&gt; &lt;OBJECT ID="object2"&gt;yellow&lt;/OBJECT&gt; &lt;/MODULE&gt; &lt;/COMMAND&gt;</pre>
<b>Receive</b>	<pre>&lt;COMMANDRESULT SERIAL="example" ERROR="0"&gt; &lt;/COMMANDRESULT&gt;</pre>

For each object, specify the color of the border. See section on Parameter Colors for the list of colors available.

**Adjust Background**

Adjust the background color of an object (currently only text background)

<b>Send</b>	<pre>&lt;COMMAND ID="adjustbackground" SERIAL="example"&gt; &lt;MODULE ID="module1"&gt; &lt;OBJECT ID="text1"&gt;green&lt;/OBJECT&gt; &lt;/MODULE&gt; &lt;/COMMAND&gt;</pre>
<b>Receive</b>	<pre>&lt;COMMANDRESULT SERIAL="example" ERROR="0"&gt; &lt;/COMMANDRESULT&gt;</pre>

For each object, specify the color of the text background. See section on Parameter Colors for the list of colors available.

**Adjust Text**

Adjust the lines of text in a text object

<b>Send</b>	<pre>&lt;COMMAND ID="adjusttext" SERIAL="example"&gt; &lt;MODULE ID="module1"&gt; &lt;OBJECT ID="text1"&gt; &lt;LINE ID="0"&gt;Line 1&lt;/LINE&gt; &lt;LINE ID="2"&gt;Text&lt;/LINE&gt; &lt;/OBJECT&gt; &lt;OBJECT ID="text2"&gt; &lt;LINE ID="1"&gt;Line 2&lt;/LINE&gt; &lt;/OBJECT&gt; &lt;/MODULE&gt; &lt;/COMMAND&gt;</pre>
<b>Receive</b>	<pre>&lt;COMMANDRESULT SERIAL="example" ERROR="0"&gt; &lt;/COMMANDRESULT&gt;</pre>

For each object, specify the line numbers to update and the text to apply. Note: this does not alter the on/off state of a line of text. For changes made using this command to be visible, the associated lines of text need to be turned on in the Object Properties of the text object in the current layout.

**Hide Text**

Hide a text object

<b>Send</b>	<pre>&lt;COMMAND ID="hidetext" SERIAL="example"&gt; &lt;MODULE ID="module1"&gt; &lt;OBJECT ID="text1"&gt;1&lt;/OBJECT&gt; &lt;OBJECT ID="text2"&gt;0&lt;/OBJECT&gt; &lt;/MODULE&gt; &lt;/COMMAND&gt;</pre>
<b>Receive</b>	<pre>&lt;COMMANDRESULT SERIAL="example" ERROR="0"&gt; &lt;/COMMANDRESULT&gt;</pre>

For each text object stated, use 0 in the character data to make the object visible, 1 to hide it.

## SIERRA VIDEO

### Set the Source of a Video Object

Updates the video source of a video object

<b>Send</b>	<pre>&lt;COMMAND ID="setobjectsource" SERIAL="example"&gt; &lt;MODULE ID="module1"&gt; &lt;OBJECT ID="object1"&gt;2&lt;/OBJECT&gt; &lt;OBJECT ID="object2"&gt;1&lt;/OBJECT&gt; &lt;/MODULE&gt; &lt;/COMMAND&gt;</pre>
<b>Receive</b>	<pre>&lt;COMMANDRESULT SERIAL="example" ERROR="0"&gt; &lt;/COMMANDRESULT&gt;</pre>

For each object that is to have its source changed, specify the 0-based source number in the character data section of the OBJECT element.

**Note:** There is limited routing of sources to objects available – e.g. A VIP3 card has a 4x4 input to output matrix. If input 1 is selected to be displayed in 2 separate objects, then only 2 other inputs can be displayed in 2 other objects on screen. In other words, only 4 video tiles can be sourced from each VIP3. However, note that each of these 4 objects can be displayed on both outputs by selecting “Display on both outputs” in the edit object dialog.

If the assignment of sources to independent video objects exceeds 4 this then the object that was most recently assigned the source wins. The other object(s) with the same source displays black.

## Source Related Commands

### Set Source Name

Set the UMD text for a source

<b>Send</b>	<pre>&lt;COMMAND ID="setsourcenam" SERIAL="example"&gt; &lt;MODULE ID="module1"&gt; &lt;SOURCE ID="5"&gt; &lt;NAME&gt;Source5&lt;/NAME&gt; &lt;/SOURCE&gt; &lt;SOURCE ID="11"&gt; &lt;NAME&gt;Source11&lt;/NAME&gt; &lt;/SOURCE&gt; &lt;/MODULE&gt; &lt;MODULE ID="module2"&gt; &lt;SOURCE ID="8"&gt; &lt;NAME&gt;Source8&lt;/NAME&gt; &lt;/SOURCE&gt; &lt;/MODULE&gt; &lt;/COMMAND&gt;</pre>
<b>Receive</b>	<pre>&lt;COMMANDRESULT SERIAL="example" ERROR="0"&gt; &lt;/COMMANDRESULT&gt;</pre>

For each source, specify the module name (currently ignored by the MV), the source number (0 to n), and the name of the source. The name given is applied to the first line of the UMD in any objects displaying this source. It is volatile, meaning that it only remains applied to the UMD while the current layout remains on screen. Uploading a new layout or even uploading the current layout again overwrites the UMD with the text stored in the layout.

### Set Source Tally

Set the tallies for a source

<b>Send</b>	<pre>&lt;COMMAND ID="setsourcetally" SERIAL="example"&gt; &lt;MODULE ID="module2"&gt; &lt;SOURCE ID="8"&gt; &lt;TALLY ID="1"&gt; &lt;STATE&gt;0&lt;/STATE&gt; &lt;/TALLY&gt; &lt;TALLY ID="2"&gt; &lt;STATE&gt;1&lt;/STATE&gt; &lt;/TALLY&gt; &lt;/SOURCE&gt; &lt;/MODULE&gt; &lt;/COMMAND&gt;</pre>
<b>Receive</b>	<pre>&lt;COMMANDRESULT SERIAL="example" ERROR="0"&gt; &lt;/COMMANDRESULT&gt;</pre>

For each source, specify the source number (0 to n), tally number (0 to 2), and tally state (0 or 1). Tally numbers 0 and 1 are the two software tallies – the tallies need to be set as software ones in the tally properties of the object(s) displaying this source for the tallies to be affected by this command. Tally 2 is a hardware output tally (GPI) – the source needs to have a GPI output assigned as a tally output to this source for tally 2 to have any effect. (These are set in the Module Properties > GPIs > GPO Alarms tab – tally outputs are assigned here by selecting a Source x tally output option from the list).

### Get Source Tally

Get the tallies for a source

<p><b>Send</b></p>	<pre>&lt;COMMAND ID="getsourcetally" SERIAL="example"&gt; &lt;MODULE ID="module2"&gt; &lt;SOURCE ID="9"&gt; &lt;TALLY ID="0"&gt;&lt;/TALLY&gt; &lt;TALLY ID="1"&gt;&lt;/TALLY&gt; &lt;TALLY ID="2"&gt;&lt;/TALLY&gt; &lt;/SOURCE&gt; &lt;SOURCE ID="18"&gt; &lt;TALLY ID="1"&gt;&lt;/TALLY&gt; &lt;/SOURCE&gt; &lt;/MODULE&gt; &lt;/COMMAND&gt;</pre>
<p><b>Receive</b></p>	<pre>&lt;COMMANDRESULT SERIAL="example" ERROR="0"&gt; &lt;MODULE ID="module2"&gt; &lt;SOURCE ID="9"&gt; &lt;TALLY ID="0"&gt; &lt;STATE&gt;0&lt;/STATE&gt; &lt;/TALLY&gt; &lt;TALLY ID="1"&gt; &lt;STATE&gt;1&lt;/STATE&gt; &lt;/TALLY&gt; &lt;TALLY ID="2"&gt; &lt;STATE&gt;0&lt;/STATE&gt; &lt;/TALLY&gt; &lt;/SOURCE&gt; &lt;SOURCE ID="18"&gt; &lt;TALLY ID="1"&gt; &lt;STATE&gt;1&lt;/STATE&gt; &lt;/TALLY&gt; &lt;/SOURCE&gt; &lt;/MODULE&gt; &lt;/COMMANDRESULT&gt;</pre>

For each source, specify the source number (0 to n), and tally number (0 to 2). Tallies 0 and 1 refer to the two software tallies and return their current on/off state as set by the *setsourcetally* command or other sources that can control the tallies by software such as the TSL UMD protocol. Tally 2 is the state of the hardware tally input (GPI) that is assigned to the source. These are configured in the Module Properties > GPIs > GPI Inputs tab. (Note: a single source can have more than one GPI input assigned as an input tally. If a source does have multiple input tallies, then the *getsourcetally* indicates a state of 1 if any of these assigned tallies are currently asserted. Otherwise the state is 0).

## Module Related Commands

### Load a Layout

Load a layout and send it to the screen

<b>Send</b>	<pre>&lt;COMMAND ID="loadlayoutandupdate" SERIAL="example"&gt; &lt;MODULE ID="module1"&gt; &lt;LAYOUT ID="test"&gt; &lt;/LAYOUT &lt;/MODULE&gt; &lt;/COMMAND&gt;</pre>
<b>Receive</b>	<pre>&lt;COMMANDRESULT SERIAL="example" ERROR="0"&gt; &lt;/COMMANDRESULT&gt;</pre>

In the LAYOUT tag, in the ID attribute, specify the name of the layout file to load and send to the screen.

### Get Firmware Version

Get the version of firmware running on the system

<b>Send</b>	<pre>&lt;COMMAND ID="getversion" SERIAL="example"&gt; &lt;/COMMAND&gt;</pre>
<b>Receive</b>	<pre>&lt;COMMANDRESULT SERIAL="example" ERROR="0"&gt; &lt;VERSION ID="FIRMWARE"&gt;2.0.84&lt;/VERSION&gt; &lt;VERSION ID="OS"&gt;2.6.22.1.151&lt;/VERSION&gt; &lt;/COMMANDRESULT&gt;</pre>

The VERSION tag with the ID attribute set to FIRMWARE contains the version of the MultiViewer application running. The VERSION tag with the ID attribute set to OS indicates the version of Linux running on the system.

### Set Stereo Audio Monitor Output

Set the source of the stereo audio monitor output on the front panel jack.

There are 2 variations of this command.

#### Variant 1: Set the source of the audio monitor output to an SDI/HDMI embedded input.

<b>Send</b>	<pre>&lt;COMMAND ID="setaudiomonitorsource" SERIAL="example"&gt; &lt;MODULE ID="module1"&gt; &lt;OUTPUT ID="2"&gt; &lt;EMBEDDED SRC="1" PAIR="1"/&gt; &lt;DISABLELOCAL ID="1"/&gt; &lt;/OUTPUT&gt; &lt;/MODULE&gt; &lt;/COMMAND&gt;</pre>
<b>Receive</b>	<pre>&lt;COMMANDRESULT SERIAL="example" ERROR="0"&gt; &lt;/COMMANDRESULT&gt;</pre>

## SIERRA VIDEO

The OUTPUT ID number can only be 1 (the one and only stereo output).

The EMBEDDED SRC ranges from 1 to 64, selecting the SDI/HDMI video input number.

The EMBEDDED PAIR ranges from 1 to 8, selecting the SDI/HDMI embedded audio pair number.

If DISABLELOCAL ID is set to 1 then the monitor output that is being set cannot be changed in the GUI until DISABLELOCAL ID is set back to 0.

### Variant 2: Set the source of the audio monitor output to an external audio input.

<b>Send</b>	<pre>&lt;COMMAND ID="setaudiomonitorsource" SERIAL="example"&gt; &lt;MODULE ID="module1"&gt; &lt;OUTPUT ID="2"&gt; &lt;EXTERNAL PAIR="1"/&gt; &lt;DISABLELOCAL ID="1"/&gt; &lt;/OUTPUT&gt; &lt;/MODULE&gt; &lt;/COMMAND&gt;</pre>
<b>Receive</b>	<pre>&lt;COMMANDRESULT SERIAL="example" ERROR="0"&gt; &lt;/COMMANDRESULT&gt;</pre>

The OUTPUT ID number can only be 1 (the one and only stereo output).

The EXTERNAL PAIR ranges from 1 to the number of available external audio input pairs, selecting the external audio pair number.

If DISABLELOCAL ID is set to 1 then the monitor output that is being set cannot be changed in the GUI until DISABLELOCAL ID is set back to 0.

### Set the source of embedded audio outputs on the SDI/HDMI video outputs

There are 2 variations of this command.

#### Variant 1: Set the source of the embedded output pair to an SDI/HDMI embedded input.

<b>Send</b>	<pre>&lt;COMMAND ID="setaudioembeddedsources" SERIAL="example"&gt; &lt;MODULE ID="module1"&gt; &lt;OUTPUT VID="1" PAIR="1"&gt; &lt;EMBEDDED SRC="1" PAIR="1"/&gt; &lt;DISABLELOCAL ID="1"/&gt; &lt;/OUTPUT&gt; &lt;/MODULE&gt; &lt;/COMMAND&gt;</pre>
<b>Receive</b>	<pre>&lt;COMMANDRESULT SERIAL="example" ERROR="0"&gt; &lt;/COMMANDRESULT&gt;</pre>

The OUTPUT VID number indicates the video output number and can only be 1 or 2.

The OUTPUT PAIR number indicates the embedded pair number on the video output. It can range from 1 to 4 (there are only 4 output pairs available on the embedded out. On SDI out it is the first 4 pairs that get used; HDMI out only allows 4 pairs anyway).

## SIERRA VIDEO

The EMBEDDED SRC ranges from 1 to 64, selecting the SDI/HDMI video input number.

The EMBEDDED PAIR ranges from 1 to 8, selecting the SDI/HDMI embedded audio pair number of the input.

If DISABLELOCAL ID is set to 1 then the output pair that is being set cannot be changed in the GUI until DISABLELOCAL ID is set back to 0.

### Variant 2: Set the source of the embedded audio output pair to an external audio input.

<b>Send</b>	<pre>&lt;COMMAND ID="setaudioembeddedsources" SERIAL="example"&gt; &lt;MODULE ID="module1"&gt; &lt;OUTPUT VID="1" PAIR="1"&gt; &lt;EXTERNAL PAIR="1"&gt; &lt;DISABLELOCAL ID="1"&gt; &lt;/OUTPUT&gt; &lt;/MODULE&gt; &lt;/COMMAND&gt;</pre>
<b>Receive</b>	<pre>&lt;COMMANDRESULT SERIAL="example" ERROR="0"&gt; &lt;/COMMANDRESULT&gt;</pre>

The OUTPUT VID number indicates the video output number and can only be 1 or 2.

The OUTPUT PAIR number indicates the embedded pair number on the video output. It can range from 1 to 4 (there are only 4 output pairs available on the embedded out. On SDI out it is the first 4 pairs that get used; HDMI out only allows 4 pairs anyway).

The EXTERNAL PAIR ranges from 1 to the number of available external audio input pairs, selecting the external audio pair number.

If DISABLELOCAL ID is set to 1 then the monitor output that is being set cannot be changed in the GUI until DISABLELOCAL ID is set back to 0.

### Enable / Disable HDCP

This enables / disables HDCP on HDMI inputs and outputs.

<b>Send</b>	<pre>&lt;COMMAND ID="sethdcpc" SERIAL="example"&gt; &lt;MODULE ID="module1"&gt; &lt;STATE&gt;0&lt;/STATE&gt; &lt;/MODULE&gt; &lt;/COMMAND&gt;</pre>
<b>Receive</b>	<pre>&lt;COMMANDRESULT SERIAL="example" ERROR="0"&gt; &lt;/COMMANDRESULT&gt;</pre>

Set the STATE tag's character data to 0 to disable HDCP, 1 to enable it.

## Parameter Values

Some of the values applied are text values relating to a particular attribute of an object. For example colors are set using color names. The text values available are listed here.

### Color Values

Colors available for setting objects that can have their color attribute set are:

black, blue, red, green, magenta, cyan, yellow, white, grey75, grey50, grey25, grey15, darkblue, darkred, darkgreen, darkmagenta, darkcyan, darkyellow

The text values used are not case sensitive.

## TSL Protocol

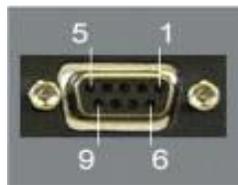
An alternative protocol also exists for the recall of the first 10 virtual layouts on the SMP-xx and MP-xx MultiViewers. This can be used either via RS-232 Serial control or via Ethernet control. Here is a list of detailed “Quick set up” instructions if you wish to use this option.

### Via Serial

#### 1. MPX-NET card setup

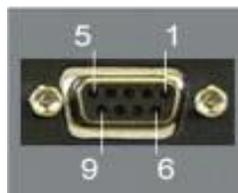
Firstly, double check the SMP-xx or MP-xx is correctly set up for serial control. There is a single serial data port on the RMP-NET connector panel that can be configured for either RS-232 or RS-422 operation. The mode of operation is set by means of jumpers CN8, CN9 and CN10 on the MPX-NET network card.

Female 9 way 'D' connector RS-422 assignments



Pin No	Function
1	GND
2	RX -
3	TX -
7	RX+
8	TX+

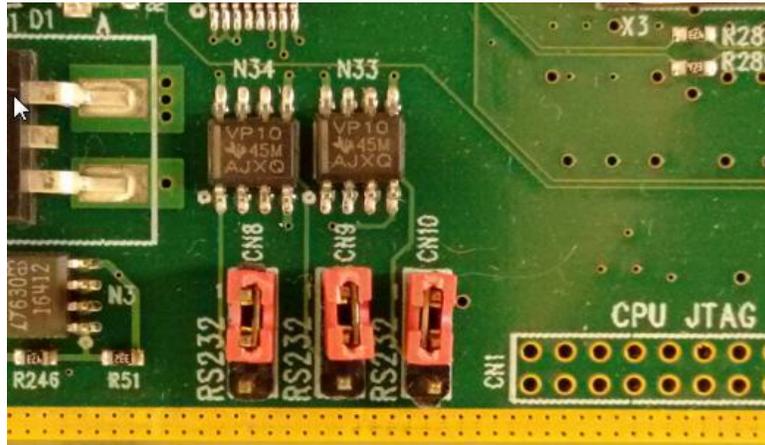
Female 9 way 'D' connector RS-232 assignments



Pin No	Function
2	TX
3	RX
5	GND

## SIERRA VIDEO

Access to change the jumper settings, requires the removal of the MPX-NET card from the front of the unit with the power removed.



MPX-NET network card showing jumper pins CN8-10 (all set to RS-232 in this image)

CN8 (pair) – Position 1/2 RS-232. Position 2/3 RS-422.

CN9 (pair) – Position 1/2 RS-232. Position 2/3 RS-422.

CN10 (pair) – Position 1/2 RS-232. Position 2/3 RS-422.

**Note:**

Pin 1 is the top-most pin for each of the three jumpers shown. The RS-232 markings printed on the PCB are there purely to highlight that these are the jumpers for the RS-232/RS-422 settings. Use the pin settings shown to set the appropriate terminations.

### 2. MultiViewer Protocol set up in the GUI.

The serial port on the MultiViewer can accept several different types of protocol depending on the application. Set the port protocol using the MultiViewer GUI via: Module>Module Properties> Protocols>Serial ports as per the image below. Then click on configure to open the dialog box seen below.



## SIERRA VIDEO

Ensure the following settings are entered as shown:

Baud Rate: 9600

Data Bits: 8

Parity: Even

Stop Bits: 1

Flow Control: None

Protocol: TSL UMD Address 0

Once these settings are entered, press ok to save them and Ok to exit the module properties menu. Then power cycle the SMP-xx/MP-xx unit.

### 3. Save the 10 Layouts

Ensure that all the desired layouts are saved to the 10 virtual layout buttons on the left hand side of the interface (circled in yellow on the screenshot below):



**Note:** This protocol only recalls the 10 virtual layouts saved to these buttons. If you wish to recall more than this remotely, you need to use the previously described “Hydra” protocol.

The procedure to save the desired layouts to the 10 virtual layout buttons is as follows:

- Load the first saved layout from the load layout option in the layout menu.
- Update the layout to the display using the Green arrow shortcut at the top of the GUI.
- Right click virtual button 1 and select save from the menu that opens to save the preset to this button.
- Repeat this process for all the other layouts you wish to recall.

## SIERRA VIDEO

### 4. The Protocol

Write the protocol command to your controller and send to recall the layouts. The protocol is of the form;

To recall layout 1:  
LOAD\_LAYOUT00000  
To recall layout 2:  
LOAD\_LAYOUT00001  
To recall layout 3:  
LOAD\_LAYOUT00002  
To recall layout 4:  
LOAD\_LAYOUT00003  
To recall layout 5:  
LOAD\_LAYOUT00004  
To recall layout 6:  
LOAD\_LAYOUT00005  
To recall layout 7:  
LOAD\_LAYOUT00006  
To recall layout 8:  
LOAD\_LAYOUT00007  
To recall layout 9:  
LOAD\_LAYOUT00008  
To recall layout 10:  
LOAD\_LAYOUT00009

**Note:** For some remote control programs the protocol takes a slightly different format. We have included some common examples below to help you.

**Example 1:** In **Kramer K-Config** (if you are using one of Kramer's Hardware button controllers)

To recall Layout 1  
0xFE,0x00,"LOAD\_LAYOUT00000"  
And so on up to;  
To recall Layout 10  
0xFE,0x00,"LOAD\_LAYOUT00009"

**Example 2:** In **Kramer K-Touch** (If you are using Kramer's K-touch program to create a customizable user interface on a Tablet or other touch device):

To recall Layout 1  
\xFE\x00 LOAD\_LAYOUT0000  
And so on up to;  
To recall Layout 10  
\xFE\x00 LOAD\_LAYOUT0009

**Example 3:** Using "**Hercules**" (Hercules is a commonly used terminal emulation program for testing remote control of devices)

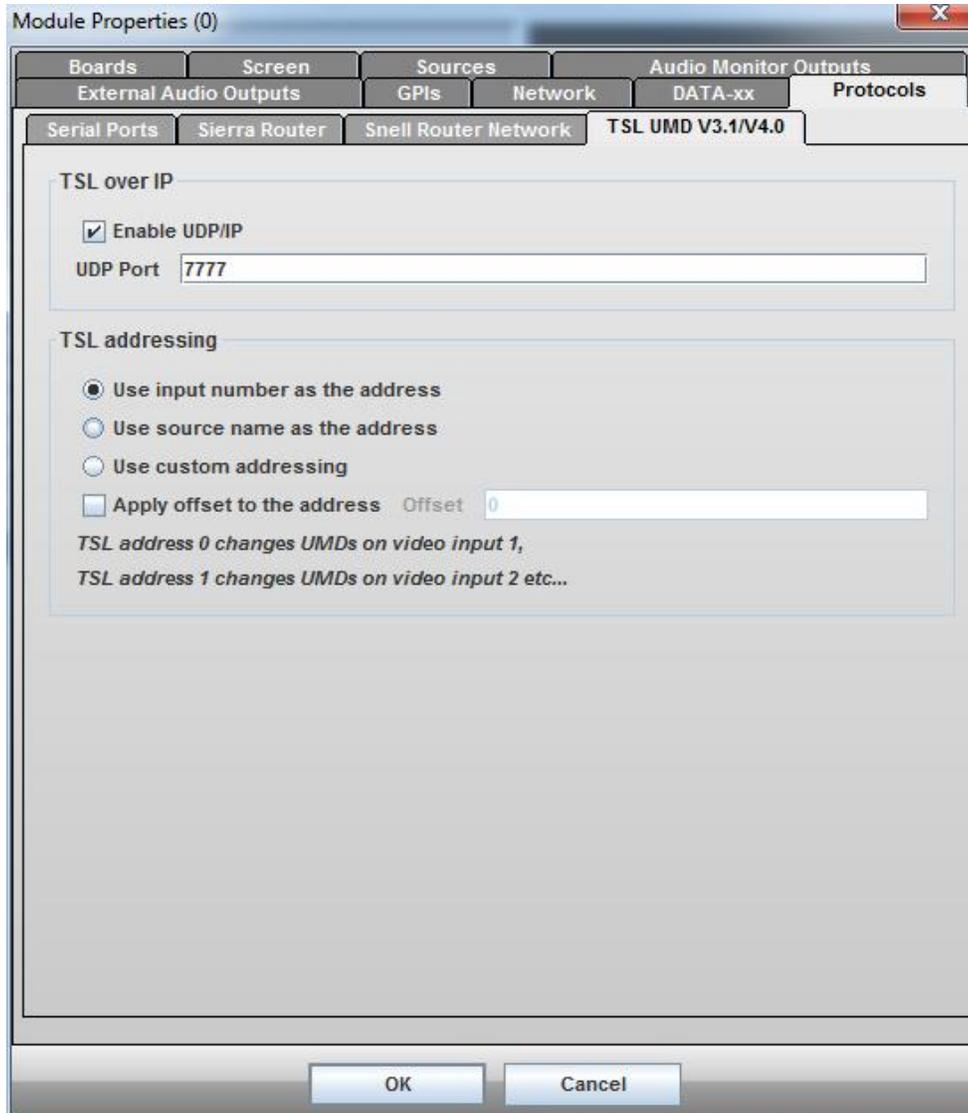
To recall Layout 1  
\$FE \$00 LOAD\_LAYOUT0000  
And so on up to;  
To recall Layout 10  
\$FE \$00 LOAD\_LAYOUT0000

## Via Ethernet

### 1. MultiViewer Protocol set up in the GUI.

The Ethernet port on the Multiviewer can accept several different types of protocol depending on the application.

TSL protocol for recall of the 10 virtual layouts communicates over UDP using port 7777. To allow the recall of MultiViewer layouts via the TSL protocol you first need to set up the MultiViewer to accept TSL protocol. Do this in the MultiViewer GUI via: Module>Module Properties> Protocols>TSL UMD V3.1/V4.0 as per the image below.



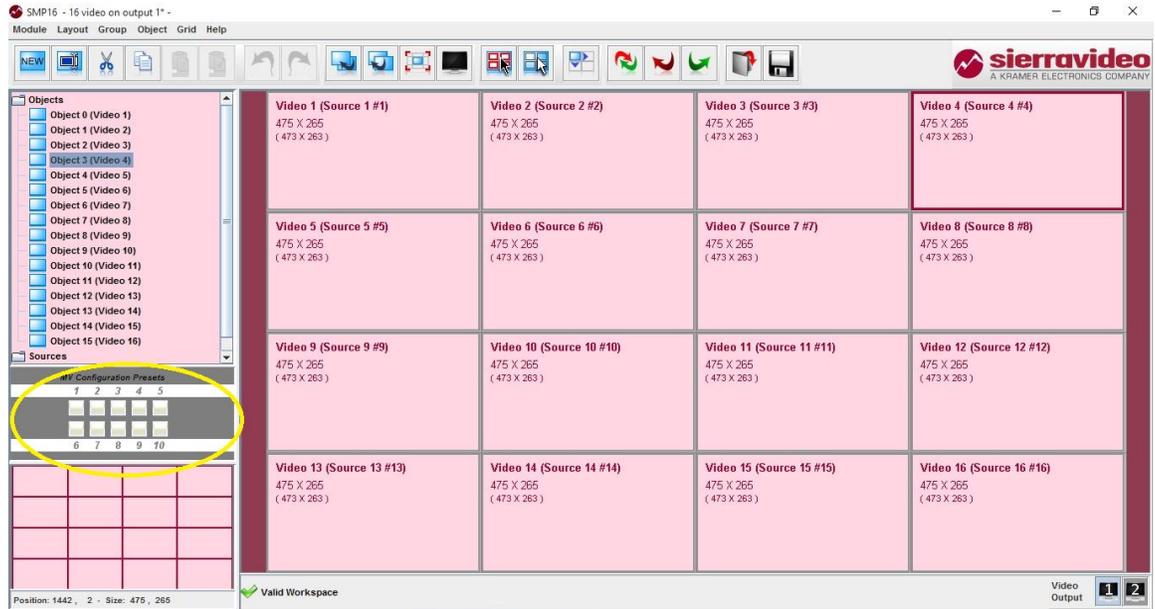
Ensure, you tick the “Enable UDP/IP” IP box and ensure the UDP port is set to 7777. Set the TSL addressing to “use input number as the address” and ensure no offset is applied to the address.

Once these settings are entered, press ok to save them and Ok to exit the module properties menu. Then power cycle the SMP-xx/MP-xx unit.

### 2. Save the 10 Layouts

## SIERRA VIDEO

Ensure that all the desired layouts are saved to the 10 virtual layout buttons on the left hand side of the interface (circled in yellow on the screenshot below):



**Note:** This protocol only recalls the 10 virtual layouts saved to these buttons. If you wish to recall more than this remotely, you need to use the previously described “Hydra” protocol.

The procedure to save the desired layouts to the 10 virtual layout buttons is as follows:

- Load the first saved layout from the load layout option in the layout menu.
- Update the layout to the display using the Green arrow shortcut at the top of the GUI.
- Right click virtual button 1 and select save from the resulting menu to save the preset to this button.
- Repeat this process for all the other layouts you wish to recall.

### 3. The Protocol

Write the protocol command to your controller and send to recall the layouts. The protocol is of the form;

To recall layout 1:

```
LOAD_LAYOUT00000
```

To recall layout 2:

```
LOAD_LAYOUT00001
```

To recall layout 3:

```
LOAD_LAYOUT00002
```

To recall layout 4:

```
LOAD_LAYOUT00003
```

To recall layout 5:

```
LOAD_LAYOUT00004
```

To recall layout 6:

```
LOAD_LAYOUT00005
```

To recall layout 7:

```
LOAD_LAYOUT00006
```

To recall layout 8:

## SIERRA VIDEO

LOAD\_LAYOUT00007  
To recall layout 9:  
LOAD\_LAYOUT00008  
To recall layout 10:  
LOAD\_LAYOUT00009

**Note:** For some remote control programs the protocol takes a slightly different format. We have included some common examples below to help you.

**Example 1:** In **Kramer K-Config** (if you are using one of Kramer's Hardware button controllers)

To recall Layout 1  
0xFE,0x00,"LOAD\_LAYOUT00000"  
And so on up to;  
To recall Layout 10  
0xFE,0x00,"LOAD\_LAYOUT00009"

**Example 2:** In **Kramer K-Touch** (If you are using Kramer's K-touch program to create a customizable user interface on a Tablet or other touch device):

To recall Layout 1  
\\xFE\\x00 LOAD\_LAYOUT0000  
And so on up to;  
To recall Layout 10  
\\xFE\\x00 LOAD\_LAYOUT0009

**Example 3:** Using "**Hercules**" (Hercules is a commonly used terminal emulation program for testing remote control of devices)

To recall Layout 1  
\$FE \$00 LOAD\_LAYOUT0000  
And so on up to;  
To recall Layout 10  
\$FE \$00 LOAD\_LAYOUT00004.

# Specifications

## Main Frame (SMP-xx and MP-xx MultiViewers)

Signal Inputs	
Video	<p><b>VIP3 – 4 video inputs per card can accept (with appropriate connector panels):</b></p> <p>Digital:</p> <p>SD-SDI (SMPTE259M 270Mb): 525/60, 625/60</p> <p>HD-SDI (SMPTE292M, SMPTE424M Level A Mapping):</p> <p>HDMI up to 1920x1200@60Hz</p> <p>Analog:</p> <p>Composite (CBVS 1V P-P), limited to 2 inputs per card: PAL, PAL-M, NTSC, NTSC-4.43, SECAM</p> <p>YUV Component (using RMP-AN4 connector panel max of 2 inputs per card)</p> <p>RGBHV at 525/625 Lines Video level (using RMP-AN4 connector panel max of 2 inputs per card)</p>
Embedded audio	<p>Embedded audio derived from SDI (up to 16 channels per source)</p> <p>HDMI</p> <p>Dolby E meter segment metadata level metering (optional via VIP-3D scaler card)</p>
External audio	<p>Via optional audio input cards:</p> <p>AIPxxA - Analog (up to 32 channels/card)</p> <p>AIPxxD - AES/EBU (up to 32 pairs (64 channels)/card with SRC (32kHz-192kHz re-sampled to 48kHz)</p> <p>AIP32AD – Combined analog and digital audio input card</p>
LTC	SMPTE-12M unbalanced. >0.5Vpp

**Note:** This table is also available in a printer friendly version in **Appendix H**

**SIERRA VIDEO**

<b>Signal Outputs</b>				
Video	2 x independent HDMI/DVI each with a parallel SDI output			
Standards supported	HDMI output	With embedded audio	Slaved SDI output	With embedded audio
720p50 (1280x720@50Hz)	□	□	□	□
720p59.94 (1280x720@59.94Hz)	□	□	□	□
720p60 (1280x720@60Hz)	□	□	□	□
1080p50 (1920x1080@50Hz)	□	□	□	□
1080p59.94 (1920x1080@59.94Hz)	□	□	□	□
1080p60 (1920x1080@60Hz)	□	□	□	□
XGA (1024x768@60Hz)	□			
SXGA+ (1400x1050@60Hz)	□			
1600x1200@60Hz	□			
Latency	Processing delay varies from 2-3 fields for interlaced video inputs, 2-3 frames for progressive video inputs, depending on timing relationship between the input and output.			
Audio	<p>One analog audio monitor output via front panel mounted headphone socket (6.35mm), with delay compensation, may be assigned from any audio source. Embedded audio may be de-muxed from both the HDMI and SDI video inputs.</p> <p>Optional audio output cards:</p> <p><b>AOPxxA</b> - Analog (up to 32 channels/card)</p> <p><b>AOPxxD</b> - AES/EBU (up to 32 pairs (64 channels)/card)</p>			
<b>Alarms</b>				
Video inputs	Loss of sync, loss of luminance, freeze frame			
Audio inputs	Loss of embedded or external audio, over-level, out of phase channel pairs			
Metadata inputs	Loss of VITC (SDI only), loss of V-Chip (composite only), teletext (analog only), subtitles, video non-sync detection			
Alarm indication	Visual (in display), GPI, LAN, SNMP traps			

**SIERRA VIDEO**

<b>Metadata</b>	
Decoding/monitoring	Teletext (WST) subtitles (ITU-R BT.653-3) SD-SDI only OP-47 subtitles, SD- HD- 3G-SDI AFD driving aspect ratio (SMPTE 2016-2007), SD- HD- 3G-SDI WSS driving aspect ratio (ETSI EN 300 294), composite only D-VITC timecode display (SMPTE-12M-2008 VITC), SD-SDI only ATC timecode display (SMPTE-12M-2008 ATC), SD- HD- 3G-SDI
<b>GPI I/O</b>	
Global port	8 inputs / 4 outputs per MultiViewer (assignable).
Video I/P card port	8 inputs / 4 outputs per video I/P card (assignable).
<b>Audio Meter Scales and Ballistics</b>	
NORDIC:	Overall dynamic range: 54dB (+12 to -42dB) Attack time: 10mSec Decay time: 1.7Sec per 20dB decay
DIN PPM:	Overall dynamic range: 55dB (+5 to -50dB) Attack time: 10mSec Decay time: 1.5Sec per 20dB decay
BBC PPM:	Overall dynamic range: 24dB +3dB down "Mark 1" (+12 to -12dB) Attack time: 10mSec Decay time: 2.8Sec per 24dB decay (from "Mark 7" to "Mark 1")
VU:	Overall dynamic range: 23dB (+3 to -20dB) Attack time: 300mSec Decay time: 300mSec per 20dB decay
VU EXT:	Overall dynamic range: 60dB (+10 to -50dB) Attack time: 300mSec Decay time: 300mSec per 20dB decay
AES/EBU:	Overall dynamic range: 60dB (0 to -60dB) Attack time: < 5ms Decay time: 1.5Sec per 20dB decay
<b>Phase Correlation Display</b>	
	Attack time: 0.4Sec for zero to $\pm 1$ deviation Decay time: 0.4Sec for $\pm 1$ to zero deviation Input dynamic range: 45dB Minimum input level: -45dBu

**SIERRA VIDEO**

<b>Mechanical</b>	
<b>SMP-xx MultiViewer</b>	
Rack Size	1RU
Details	19" Rack Mountable Frame with removable front panel, temperature controlled fan assisted ventilation, 6 card slots, separate connector panel connector modules and power supply / fan status indicators.
Variants	SMP-Rxx MultiViewer equipped with a front-end 16x16 input video router and a stand-alone 16x16 SDI router capability. SMP-Sxx MultiViewer without internal 16x16 SDI router
Dimensions	445mm(W) x 511mm(D) x 44mm(H)
Weight	6kg (full frame)
<b>MP-xx MultiViewer</b>	
Rack Size	3RU
Details	19" Rack Mounting Frame with removable front panel, temperature controlled fan assisted ventilation, 20 card slots, separate connector panel connector modules and power supply / fan status indicators.
Dimensions	440mm(W) x 455mm(D) x 132mm(H)
Weight	10.5kg (full frame)
<b>Power</b>	
<b>SMP-xx MultiViewer</b>	
Connectors	AC - Single IEC Mains Socket DC – Single 2-pole DC power socket
Power	Maximum power consumption 204W
Input current rating	2.5AAC, 8.5A DC
Fusing	1x 3.15A Fuse; 5x20mm ceramic body, Anti-surge/Time delay inside IEC socket
<b>MP-xx MultiViewer</b>	
Connectors	AC - Single IEC Mains Socket DC – Single 2-pole DC power socket
Power	Maximum power consumption 576W
Input current rating	7AAC, 24A DC
Fusing	1x 8A Fuse; 5x20mm ceramic body, Anti-surge/Time delay inside IEC socket
<b>Environmental</b>	
Operating Temperature	0°C to 40°C
Relative Humidity	70% max, non-condensing
Ventilation	Fan assisted. Front Inlet, connector panel exhaust

**SIERRA VIDEO**

<b>Compliance</b>	
EMC – Emissions	EU: EN55103-1 USA: 47 CFR: 2009, Part 15, Sub-part B (Class A)
EMC – Immunity	EU: EN55103-1
Safety	EN: EN60950-1 USA: UL1419 (3 <sup>rd</sup> Edition) – UL File E193966)
Hazardous Material	UK: RoHS-6 – Complies with EU Directive
<b>I/O Cards</b>	
Video	VIP3: 4 x video inputs per card (formats as described in the video signal inputs section earlier in the specifications) VIP3D: As above
Audio	AIPxxA: up to 32x analog audio input channels AIPxxD: up to 32x AES/EBU pairs (64 channels) digital audio input AIP32AD: Combined analog and digital audio input card AOPxxA: up to 32x analog audio output channels AOPxxD: up to 32x AES/EBU (64 channels) digital audio output
<b>Front panel</b>	
	Power supply and fan failure LED indicators on front panel 1 x OLED display and control knob 1 x USB type A port 1 x 6.35mm stereo audio socket
<b>Frame Connector panel Panel (SMP-xx and MP-xx)</b>	
	1x IEC AC power socket 1x 2-pole DC power socket
<b>RMP-NET network connector panel:</b>	
	1x BNC for reference input
	1x BNC for timecode input
	1x 15 way 'D' connector GPI I/O port
	1x RS-232/RS-422 port for UMD tally via TSL
	1x RJ-45 auxiliary Ethernet (LAN) port
<b>RMP-MVC (or MPX-DVI) MVC connector panel:</b>	
	2x independent HDMI video outputs (or 2x independent DVI outputs)
	2x BNC SDI outputs, each paired with one of the HDMI (DVI) connectors
	1x RJ-45 Ethernet (LAN) connector for browser control, NTP clock update and/or remote panel control

## Backup Power Supply (POWER-xx)

<b>Front</b>	
	2x Green LED indicator for presence of AC input and DC output per supply fitted
<b>Connector panel</b>	
	1x 2-pole DC power outlet socket
	3x IEC AC power socket (one for each supply that can be fitted)
	25 way D-type (CN500) into which supplied d-type shell MUST be fitted for DC output to be active
<b>Mechanical</b>	
	1RU Power Supply Outline Dimensions~: 484mm(W) x 351mm(D) x 44mm(H) Weight: up to 11kg with 3x psu fitted (one supplied as standard)
<b>Power</b>	
	Auto sensing 100 – 240 V AC, 50/60Hz switch mode 1kW power supply with 24V DC single rail output.

# Troubleshooting

P1 should always be on if the internal 24V DC is available and P2 is on if the external POWER-xx 24V DC back up supply is connected. Always ensure that power is connected before using the problem solving guide.

**Note:** Each unit leaves the factory with two fuses present in the pull-out flap of the connector panel IEC connector. Only the **LIVE** conductor is fused, the other fuse is a spare which requires the user to swap into the live slot in the event of a blown fuse.

Using the **SMP-xx** chassis as an example, the position of the two fuses can be seen in the image below, the **LIVE** fuse is the **LEFT** hand fuse and the right hand fuse is a **spare** (in the case of the **MP-xx** chassis, the IEC unit is turned 90° anticlockwise, so the **LIVE** fuse is the **BOTTOM** fuse and the **spare** fuse is at the **top**).



If the fuse has blown, remove it and replace with the spare fuse as shown below.

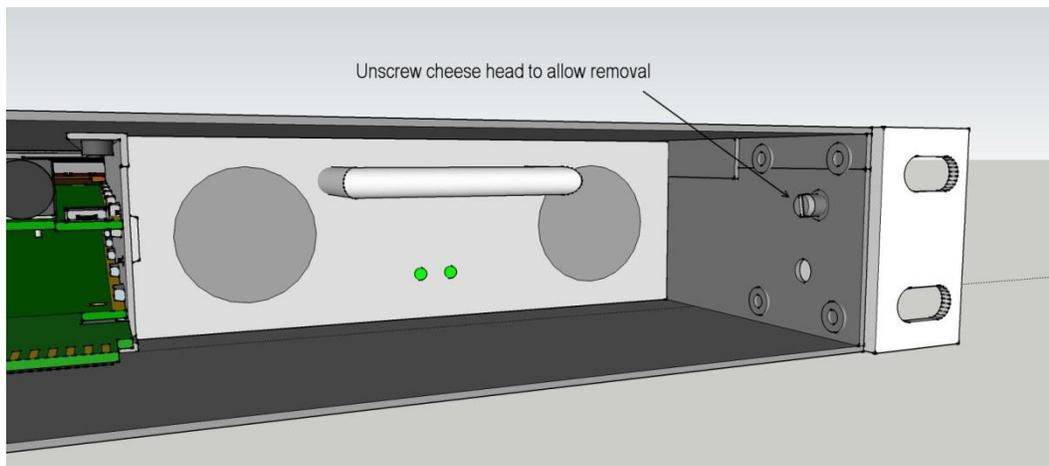


Always replace the fuse with one of the correct value as shown in the **Installation** section.

In the event of a power supply failure, there is both front panel and remote panel indication. If installed, the optional POWER-xx external backup PSU is able to sustain operation of the unit until while the internal PSU is replaced.

**Note:** The internal PSU is easily removed from a chassis as follows:

**SMP-xx MultiViewer** – Remove the front panel as described in the **Operation** section. Then undo the cheese head screw mounted on the right hand side of the chassis (shown below) and remove it and the hollow pillar it is threaded on. DO NOT lose these.



Depress the black tab on the left hand side of the PSU while pulling the unit clear. Replace with a new PSU and push home until a click is heard indicating the spring loaded retaining mechanism has snapped into place. Screw the cheese head and pillar back into place so that the front panel can then be replaced.

**MP-xx MultiViewer** – Removal of the PSU from this chassis simply requires the black tab at the bottom of the PSU to be depressed while pulling the PSU clear. Replace with a

## SIERRA VIDEO

new PSU and push home until a click is heard indicating the spring loaded retaining mechanism has snapped into place.

If the unit has power, but there appears to be a problem first check the front panel OLED for any further information, if this is not working or no additional information is available then remove the front panel and check the status of the OLED display on the front edge of the MPX-NET network card. Where the MPX-NET card is capable (i.e. its processor is still functioning) it reports any warnings it can identify via the OLED display.

(Details should be reported to your local dealer).

## Sample Problems and their Solutions

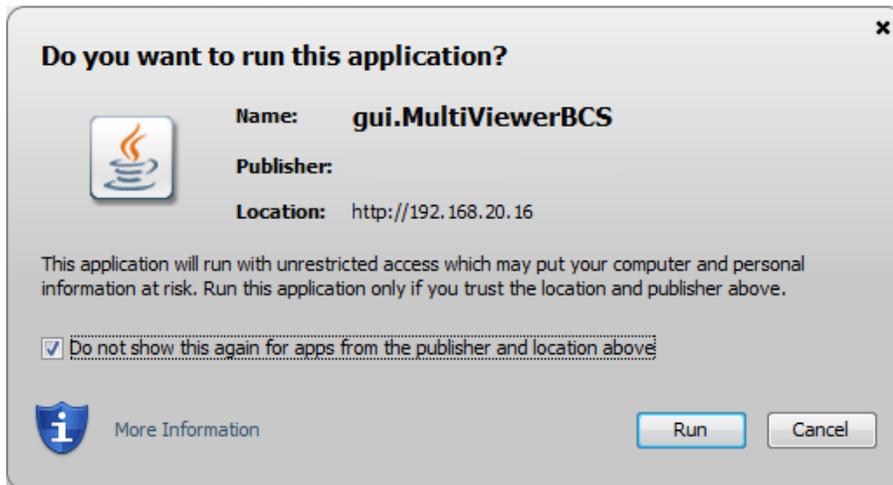
### The Java applet takes a long time to launch from the browser, or it does not launch at all due to security issues

#### This only applies to Java platforms 1.7.0\_21 and above

Java platforms 1.7.0\_21 and above have extra security measures to prevent untrusted Java applications from running. MultiViewer firmware versions 3.0.22 and above have a certificate to assist with the security checks that Java carries out, however there can still be some issues depending on the Java security settings, and whether or not the PC has access to the internet.

#### On a PC with access to the internet:

If the MultiViewer application has never been launched on the PC before then the first time it is launched the following message appears. It is asking for permission to install the security certificate. Tick the “Do not show this again...” box so that you do not have to acknowledge this every time the application needs to launch.



As long as the PC has access to the internet then there should be no further issues. Java checks that the security certificate has not been revoked.

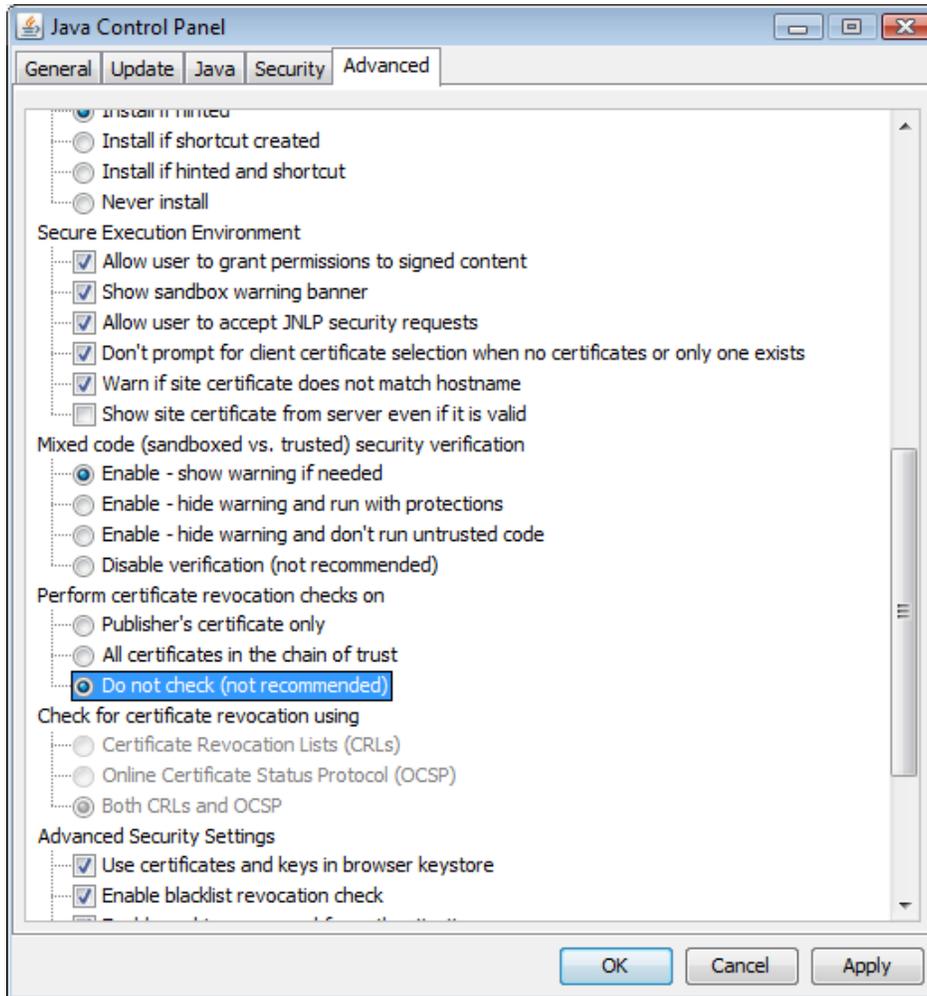
#### On a PC without access to the internet:

With Java's default security settings, when an application is launched from a browser it tries to check whether the application's certificate has been revoked. After failing to connect to the internet (about a 30 seconds), it asks whether you want to run the application or not, indicating

## SIERRA VIDEO

that it was unable to check the certificate.

To avoid this message, and the delay in starting the application, the certificate revocation needs to be disabled in the Java Control Panel. This is in the advanced tab, as shown in the following image.



### There is no video output

Check that there is power and at least P1 or P2 is lit.

Check front panel OLED display for warnings.

Check that the video output resolution is not beyond the capability of the display. (See answer to question below).

An output should be seen once the unit has booted.

### The image appears fuzzy or lacking clarity

If an analog or digital LCD/Plasma screen is used, check that the output resolution of the MV is set to the native resolution of the panel. This avoids forcing the LCD/Plasma screen to rescale the image. Most panels produce artefacts when their internal scalers are active.

**Output resolution is set using the Screen Resolution function under the System menu.**

**The image is not centred in the screen**

Use the monitor controls to align the image.

If an analog LCD screen is used use the auto-adjust facility.

**Unit fails to respond correctly to commands**

Power cycle the unit and/or perform a Master Reset. A Master Reset restores all settings to the factory default. This is performed by connecting a keyboard to the front panel USB port and using the command Ctrl-Alt-Del. Note that the IP address also defaults to 192.168.0.120

**Can digital audio be balanced or unbalanced?**

Yes. AES/EBU inputs may be jumper selected per channel to be either balanced or unbalanced inputs. The settings are set via jumpers on each digital audio input card as explained in the **Installation** section.

**Can I use analog bargraphs for digital inputs (or digital scales for analog inputs)?**

Yes. The range colors, break points and level references are set for the scale type and NOT the source assigned. For example assuming the following settings:

- Analog scale type: AES/EBU
- Analog/Digital scale reference: -18dBfs
- Analog 0dB reference: 0dBu
- Digital upper range point: -18dBfs
- Digital lower range point: -40dBfs

Feeding in analog 0dBu produces a level of -18dBfs, with the color changes occurring at -40dBfs and -18dBfs.

Changing the Analog 0dB reference to +4dBu produces a level of -22dBfs, with the color changes unaltered.

Changing the Analog/Digital reference to -20dBfs (with the analog ref still at +4dBu) produces a level of -24dBfs, with color changes unaltered.

The same applies to displaying digital channels on an analog scale; the color changes adhere to the analog upper and lower settings.

**What are the RS-232/RS-422 options?**

RS-232 or RS-422 operation can be selected via jumpers on the MPX-NET network card as explained in the installation section.

**Why are time clock / date settings lost when the frame is power cycled?**

This data is normally maintained by a rechargeable battery situated on the CPU board, which has a typical life of 6+ years. Loss of data indicates that the battery requires replacement. Contact your local dealer.

**Why does the message 'Program Will Not Load' appear when launching the web interface?**

This message is issued by the Java application. It's caused by the caching of an incompatible version of the applet. If using Windows, open Control Panel and click on the Java icon. Within the Temporary Internet Files section, select View. Within the Show drop-down menu, select Resources. Click on the URL heading bar to sort the view by URLs, then scroll down to 192.168.0.120:80/Applet.jar (or the appropriate IP address for the frame), and delete it.

The applet should load correctly after restarting the browser.

# Limited Warranty

Sierra Video is a Kramer Electronics Brand. As such Sierra Video products are covered by the Warranty conditions set out below by Kramer Electronics Inc.

The warranty obligations of Kramer Electronics Inc. (“Kramer Electronics”) for this product are limited to the terms set forth below:

## What is Covered?

This limited warranty covers defects in materials and workmanship in this product.

## What is Not Covered?

This limited warranty does not cover any damage, deterioration or malfunction resulting from any alteration, modification, improper or unreasonable use or maintenance, misuse, abuse, accident, neglect, exposure to excess moisture, fire, improper packing and shipping (such claims must be presented to the carrier), lightning, power surges, or other acts of nature. This limited warranty does not cover any damage, deterioration or malfunction resulting from the installation or removal of this product from any installation, any unauthorized tampering with this product, any repairs attempted by anyone unauthorized by Kramer Electronics to make such repairs, or any other cause which does not relate directly to a defect in materials and/or workmanship of this product. This limited warranty does not cover cartons, equipment enclosures, cables or accessories used in conjunction with this product.

Without limiting any other exclusion herein, Kramer Electronics does not warrant that the product covered hereby, including, without limitation, the technology and/or integrated circuit(s) included in the product, will not become obsolete or that such items are or will remain compatible with any other product or technology with which the product may be used.

## How Long Does this Coverage Last?

This limited warranty lasts for Five (5) years from the date of original purchase of this product.

## Who is Covered?

Only the original purchaser of this product is covered under this limited warranty. This limited warranty is not transferable to subsequent purchasers or owners of this product.

# Appendix A: PCB profiles

## Main Cards

The MPX-NET network main card can only be placed in Slot 0 in the front of the 1RU and 3RU MultiViewers. This is achieved by using a different connector panel finger profile than any other MultiViewer main card such as the MPX-MVC and VIP boards.

The profiles of the MPX-NET network and the other main cards are shown in the following two images:



*MultiViewer MPX-NET network card PCB profile*

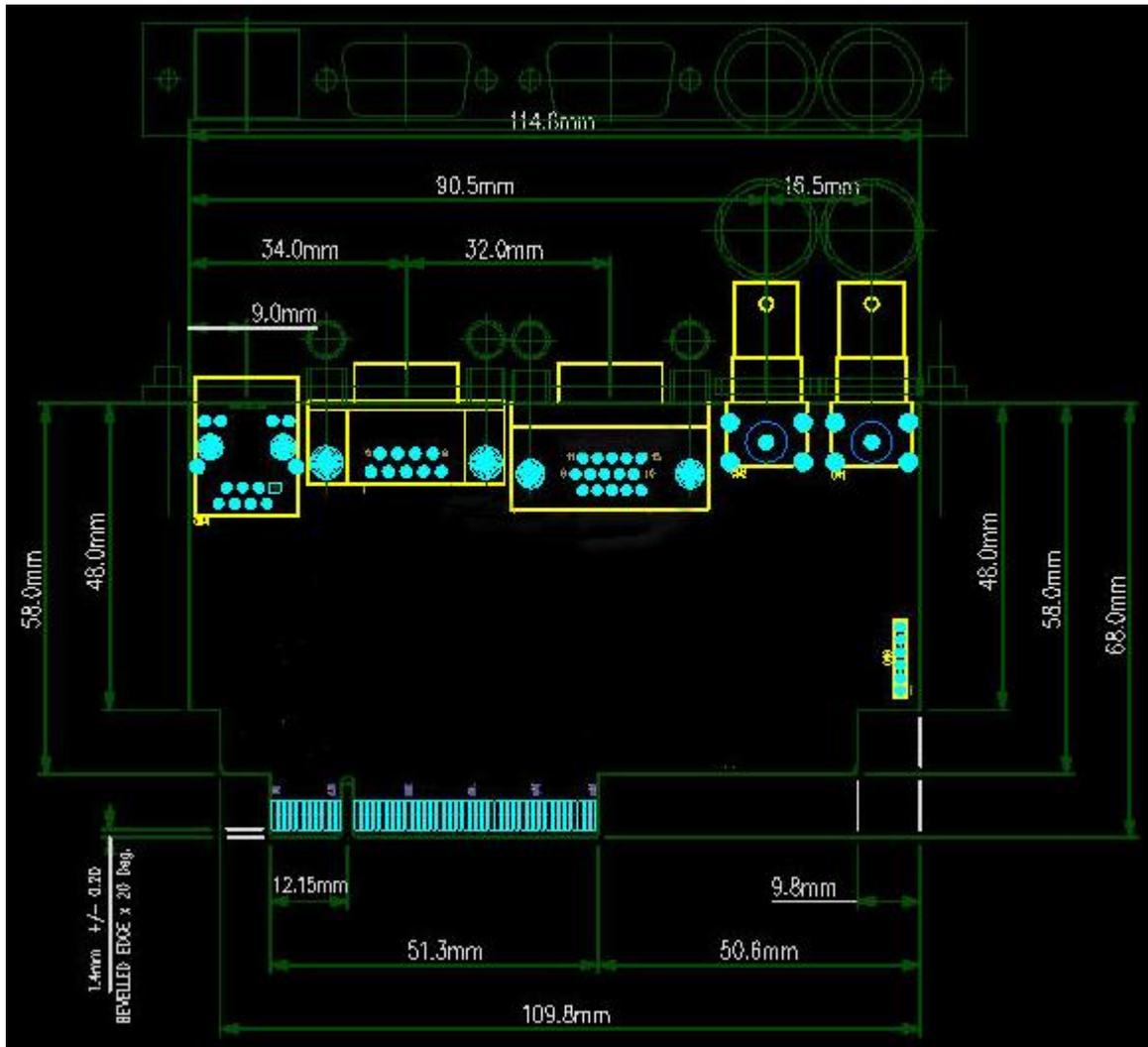


*MultiViewer main card PCB profile (e.g. MPX-MVC, VIP, AIPxxA/D and AOPxxA/D)*

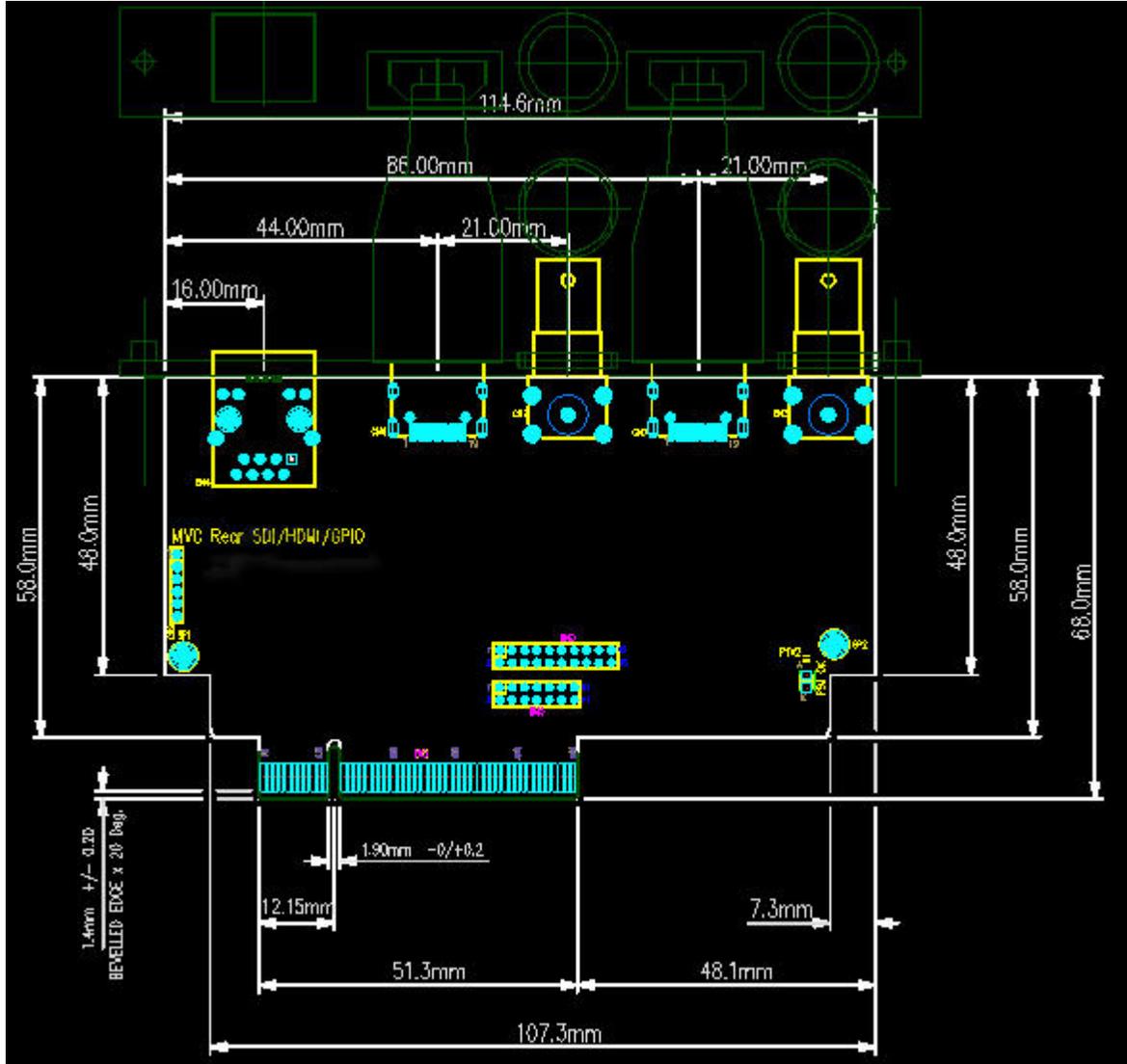
## Connector Panel Cards

Similarly, the RMP-NET network connector panel can only be placed in Slot 0 in the connector panel of the 1RU and 3RU MultiViewers. A different connector panel finger profile from all other MultiViewer connector panels is used to stop it being inserted into any other connector panel slot location.

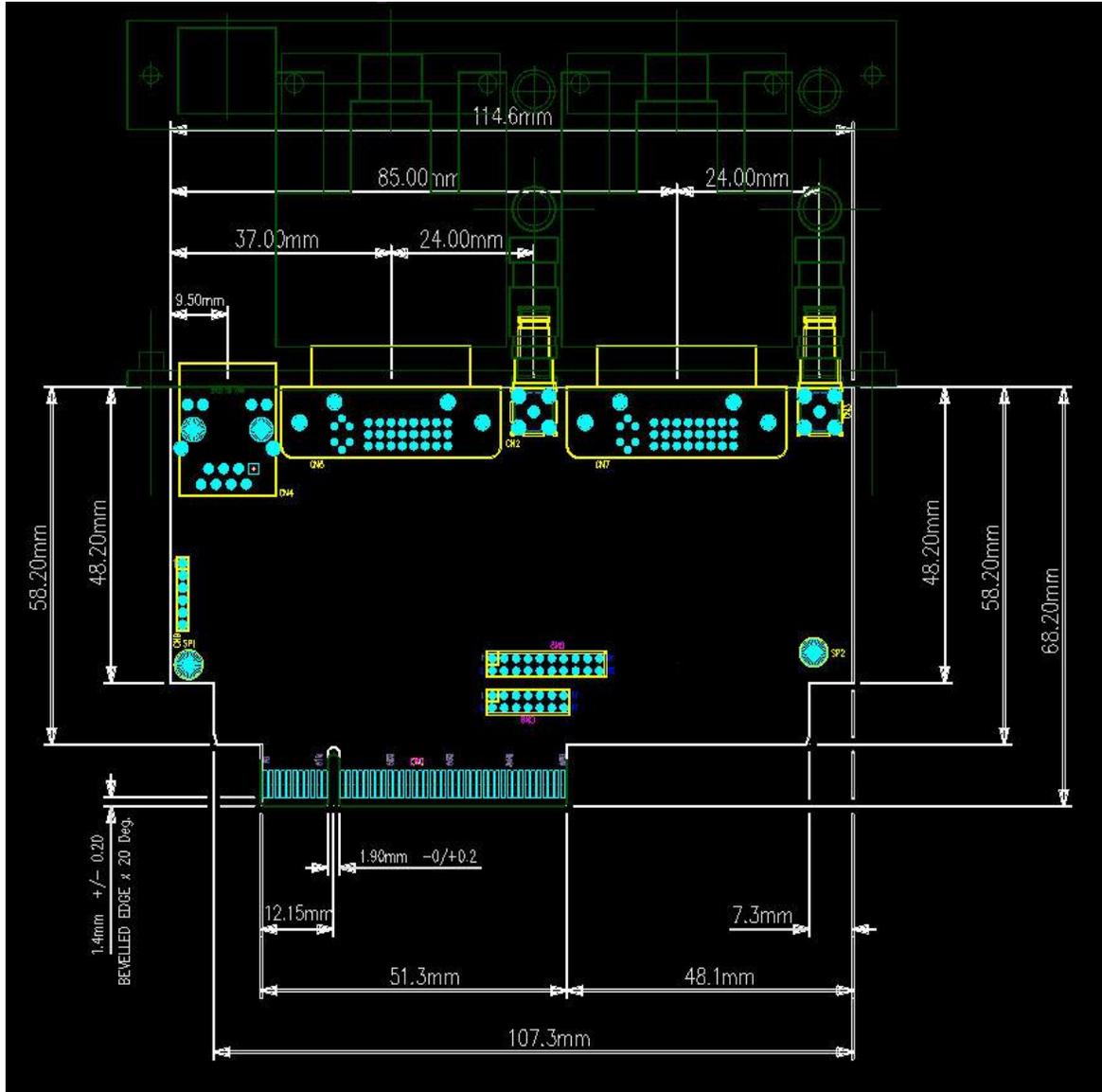
The profiles of the RMP-NET and other connector panel cards are shown in the following images:



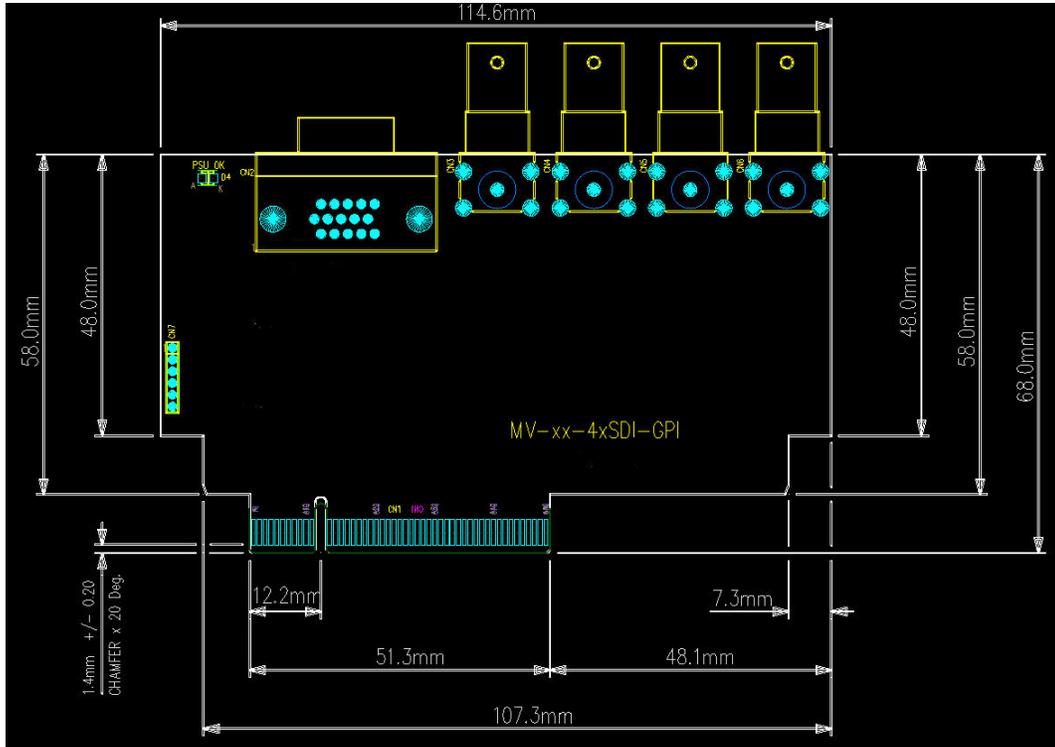
*RMP-NET connector panel PCB profile*



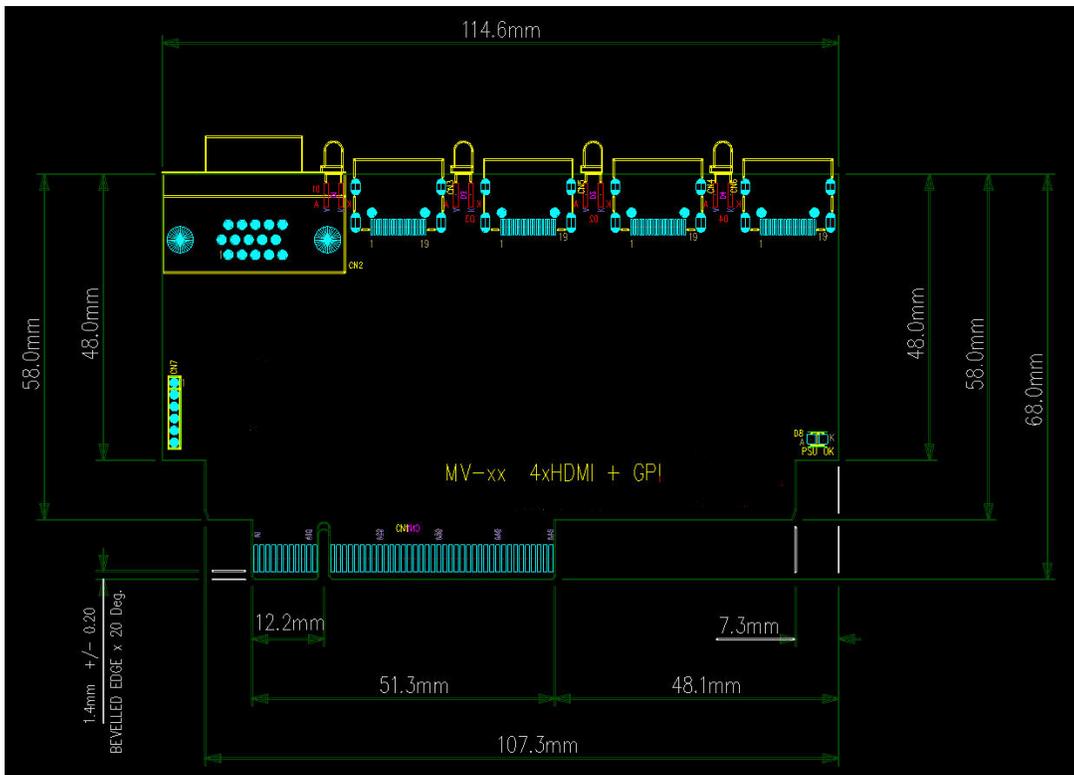
*RMP-MVC connector panel PCB profile*



RMP-DVI connector panel PCB profile

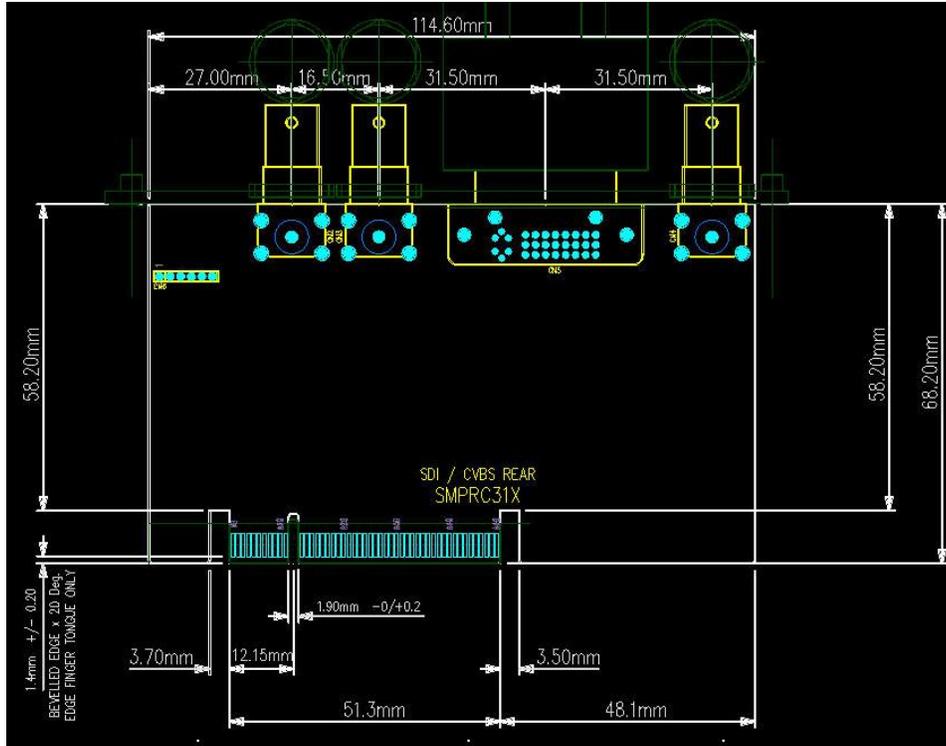


*RMP-SD4 connector panel PCB profile*

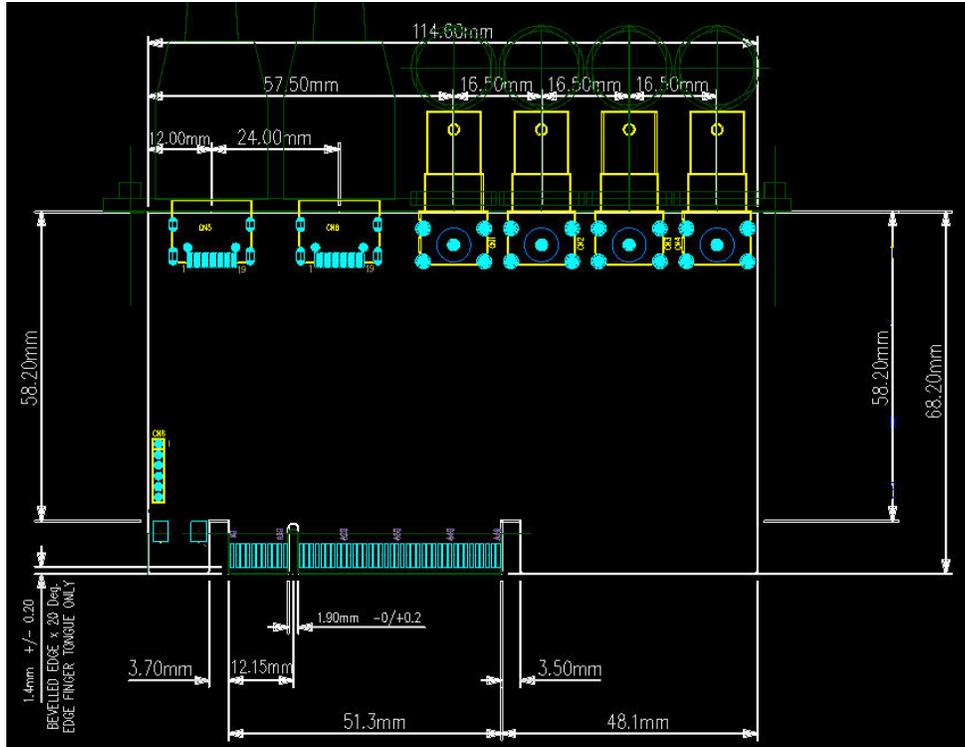


*RMP-HM4 connector panel PCB profile*

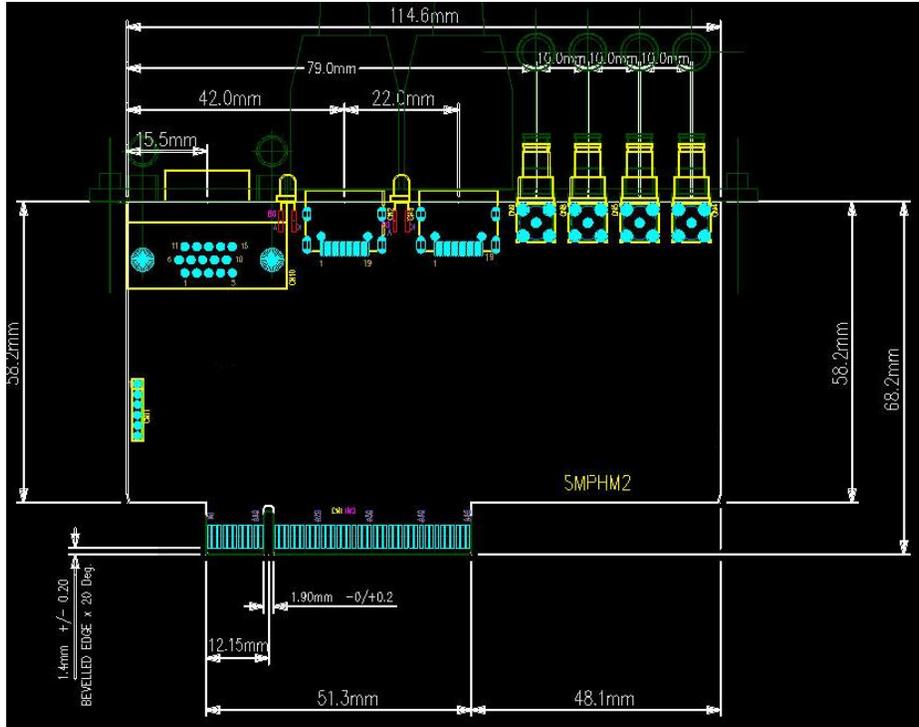




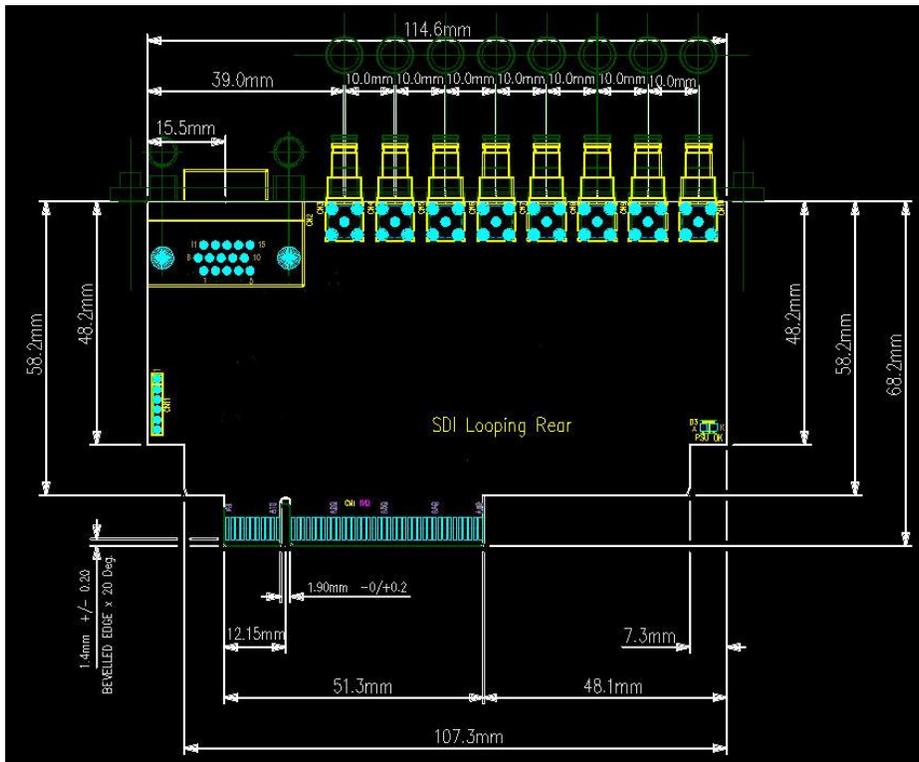
RMP-RC3 connector panel PCB profile



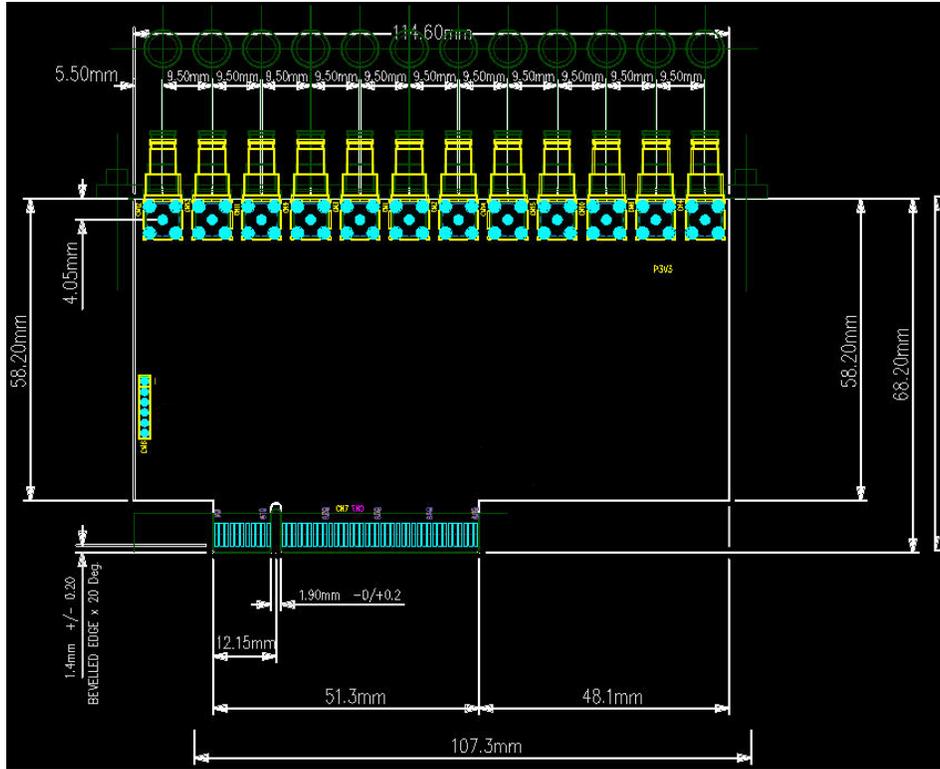
RMP-H64 connector panel PCB profile



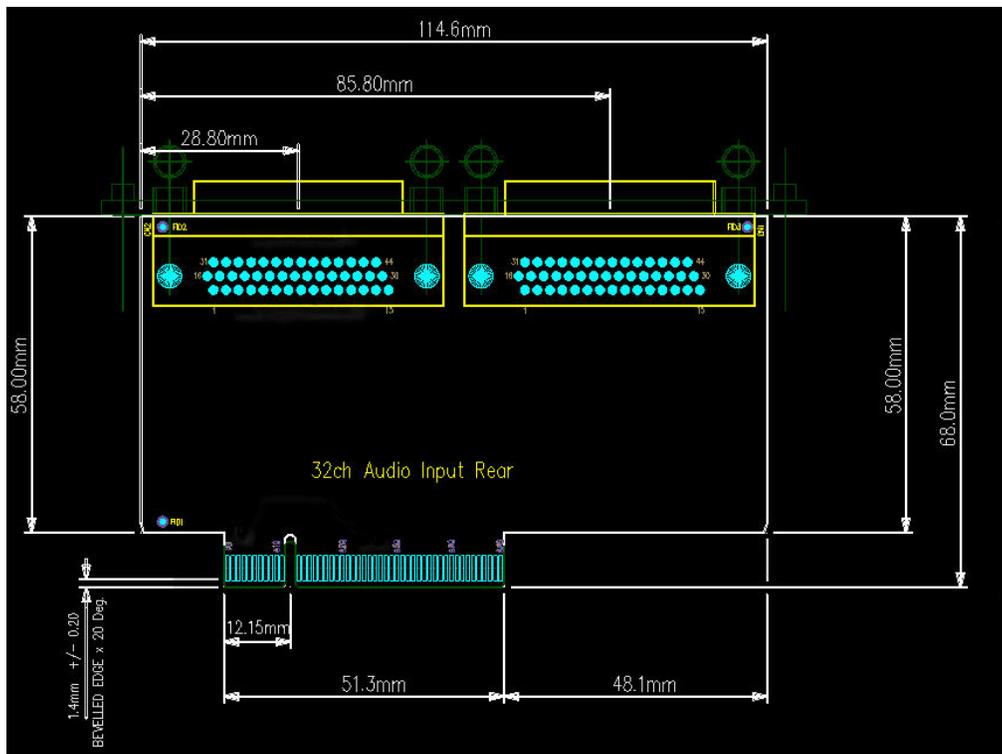
*RMP-HM2 connector panel PCB profile*



*RMP-SL4 connector panel PCB profile*



RMP-AN4 connector panel PCB profile



RMP-A32 connector panel PCB profile



## Appendix B: Audio Input Channel Numbering

The maximum number of analog and/or digital audio input channels that can be supported by a single MultiViewer is 1152. Audio can be extracted from input video sources or supplied from external sources by using dedicated analog and digital audio input cards.

**Note:** See the **Configuration rules** for detailed information on adding analog and digital audio cards to a MultiViewer.

A single analog audio input card can support up to a maximum of 32 input channels whereas a single digital audio input card supports up to 32 AES pairs giving it an audio payload capacity of 64 channels (**1 AES pair = 2 channels**).

To allow for maximum system flexibility, the analog and digital audio input cards are available in the following input configurations:

Analog audio input card	Max. no. of channels supported	Digital audio input card	Max. no. of AES pairs supported ( <i>Channels</i> )
<b>AIP08A</b>	8	<b>AIP08D</b>	8 (16)
<b>AIP16A</b>	16	<b>AIP16D</b>	16(32)
<b>AIP32A</b>	32	<b>AIP32D</b>	32(64)
An <b>AIP32AD</b> card is also available supporting a user selectable mixture of analog and digital audio inputs up to a maximum of 32 channels/AES pairs.			

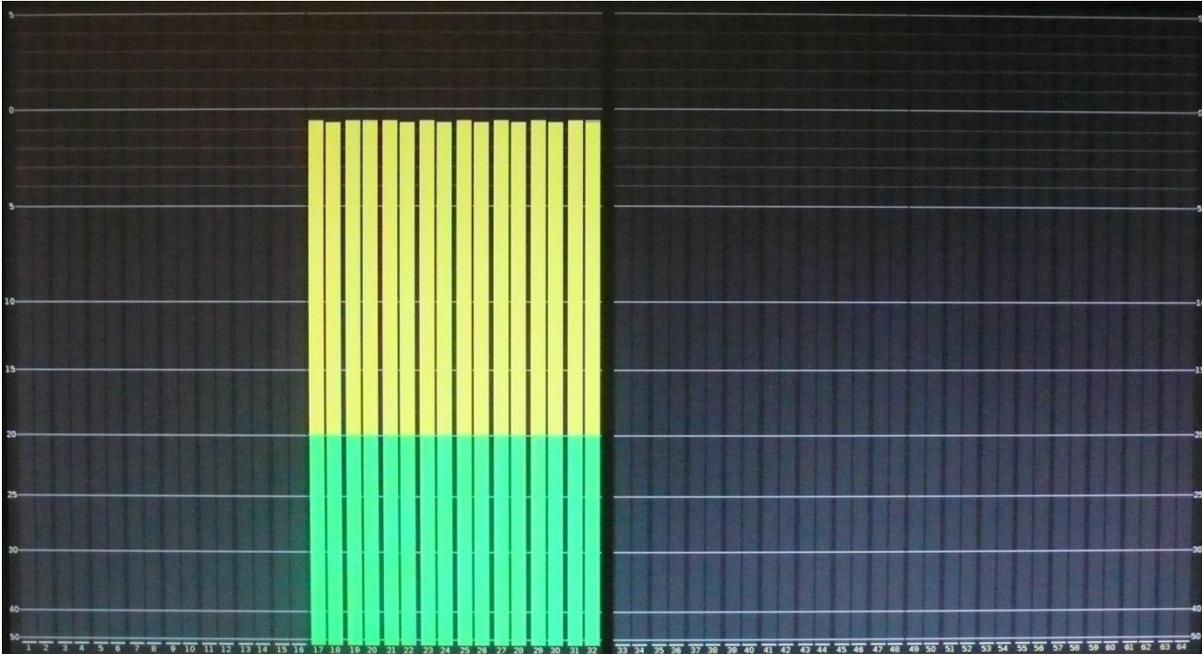
**Note:** Digital audio cards have twice the effective channel capacity of analog cards because digital audio is transmitted as AES pairs comprising two discreet channels (though these are often just the left and right stereo components).

When setting up the metering for new audio input cards, a user has the choice of using one of the default audio input layouts, editing an existing layout or using a previously edited and saved template.

**Note:** When selecting, or modifying an existing layout, the user must bear in mind that the MultiViewer audio metering is designed to accommodate a maximum of **64 channels per audio input card** added to the system.

## SIERRA VIDEO

The only audio input card that actually has a 64 channel capability is the AIP32D (32 AES pair digital capability). A screen shot of the meters for a 32 AES pair (64 channel) digital audio input (**AIP32D**) card is shown below with pairs 9-16 (channels 17-32) active.



*AIP32D metering showing pairs 9-16 active*

All other audio input cards have less than 64 channels. The MultiViewer is designed to allocate a block of 64 audio channel meters to any audio card detected regardless of type. The user is then able to allocate sub-blocks of the 64 available meters for each card when populating the MultiViewer with a mixture of analog and digital and lower input capacity cards. This ensures that if any audio card is directly replaced by another one of differing input capacity, any existing channel numbers currently being used are not over-ridden requiring a completely new layout.

Audio input cards are always placed to the left of the **MPX-MVC** video output card (when viewed from the front of the chassis) and audio input connector panels to the right of the **RMP-MVC** video output connector panel (when viewed from the back of the chassis). The MultiViewer considers the audio input card detected closest to the left of the MVC to be Audio input card 1, the next audio input card detected to the left of card 1 is Audio input card 2 and so on. The following table shows the audio channel numbering range allocated to each audio input card detected based on its position in the audio input chain:

**SIERRA VIDEO**

Audio input card number	Allocated audio channel numbering range for each card based on its position in the audio input chain
1	1-64
2	65-128
3	129-192
4	193-256
5	257-320
n	$(64(n-1) + 1) - 64n$

If a MultiViewer were to be populated with three 32 AES pair digital input cards (**AIP32D**), each of which has a 64 channel capacity, then the channel numbering for each card would be as shown in the table above with no 'unused' channel numbers. i.e.

Audio input card	Channel numbers
AIP32D 1	1-64
AIP32D 2	65-128
AIP32D 3	129-192

However, if Card 1 was replaced by a 32 channel analog input card (**AIP32A**) and Card 3 by an 8 AES pair (*16 channel*) digital card (**AIP08D**), the channel numbering scheme would be as follows:

Audio input card	Channel numbers
<b>AIP32A 1</b>	1-64 channel numbers allocated for Card 1 <b>1-32 used for the 32 channels available for this card</b> <i>33-64 not used</i>
<b>AIP32D 2</b>	65-128 channel numbers allocated for Card 2 <b>65-128 used for the 64 channels available on this card</b> <i>no unused channel numbers</i>
<b>AIP16D 3</b>	129-192 channel numbers allocated for Card 3 <b>129-160 used for the 32 channels available for this card</b> <i>161-192 not used</i>

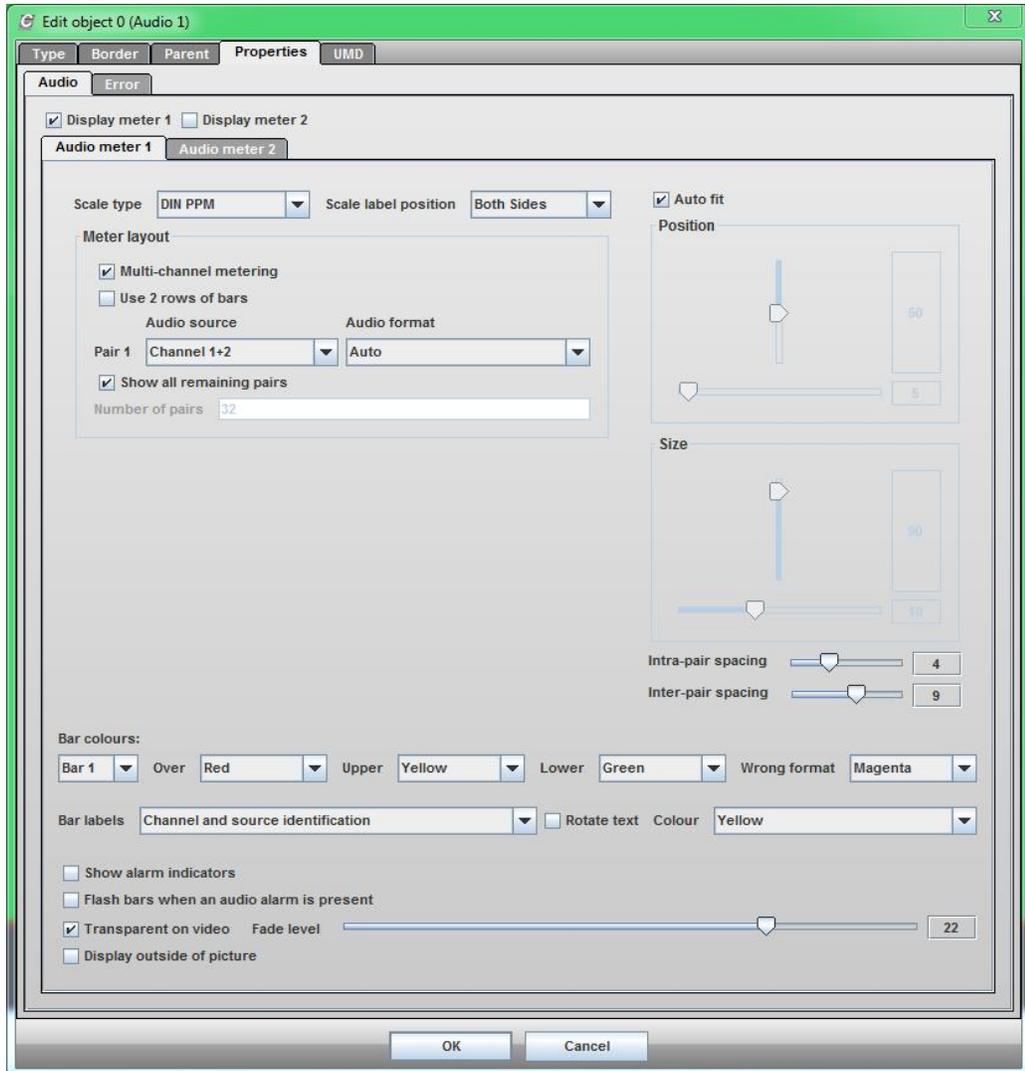
As can be seen from the above table, if Card 1 or Card 3 were then to be replaced by larger capacity cards, they would simply make use of the unused channel numbers.

## SIERRA VIDEO

The following example shows how to set-up the metering for a MultiViewer with two 32 channel analog audio input (**AIP32A**) cards present having a combined total capacity of 64 channels. As shown previously, the channel numbering is based on each card being allocated a block of 64 channels, hence in this example the channel numbering would be as follows:

Audio input card	Channel numbers
<b>AIP32A 1</b>	1-64 channel numbers allocated for Card 1 <b>1-32 used for the 32 channels available for this card</b> <i>33-64 not used</i>
<b>AIP32A 2</b>	65-128 channel numbers allocated for Card 2 <b>65-96 used for the 64 channels available on this card</b> <i>97-128 not used</i>

To create a layout that only contains the channels that exist (**1-32** and **65-96**), the fastest way is to load the **All audio channels** pre-set layout. This creates a single audio tile displaying all the audio channels that exist in the system. The same thing can be done by manually editing an audio tile and using the settings as shown here:



In particular, tick **Multi-channel metering**, select Channel 1+2 for **Pair 1**, and tick **Show all remaining pairs** to show all audio channels present in the system.

Though the user cannot edit actual channel numbers, there is a facility for the user to add custom **names** to each audio channel.

Using the Main menu, go to:

**Module > Audio channel names**

## SIERRA VIDEO

The following table appears showing the audio channels and their names:

Source 12	Source 13	Source 14	Source 15	Source 16		
Source 7	Source 8	Source 9	Source 10	Source 11		
External audio channels	Source 1	Source 2	Source 3	Source 4	Source 5	Source 6
Channel 1	CHAN 1					
Channel 2	CHAN 2					
Channel 3	CHAN 3					
Channel 4	CHAN 4					
Channel 5	CHAN 5					
Channel 6	CHAN 6					
Channel 7	CHAN 7					
Channel 8	CHAN 8					
Channel 9	CHAN 9					
Channel 10	CHAN 10					
Channel 11	CHAN 11					
Channel 12	CHAN 12					
Channel 13	CHAN 13					
Channel 14	CHAN 14					
Channel 15	CHAN 15					
Channel 16	CHAN 16					
Channel 17	CHAN 17					
Channel 18	CHAN 18					

Here the name of each audio channel can be edited. The names entered here are displayed below the meter bars if the labelling for the meter is set to **Text** in the Edit Object Properties of the tile that the meter is in.

The **External audio channels** tab is for entering all the names of the channels on external audio input cards. (This is the only tab present if the product is an audio meter only). The **Source 1**, **Source 2**, etc. tabs are for entering the names of the embedded audio input channels for each SDI / HDMI video input present.

# Appendix C: Audio Routing When Using the SMP-Rxx

## Available Audio Channels When Using the SMP-Rxx

Due to the nature of the router midplane in the SMP-Rxx, the following analog L/R channel and digital AES pair restrictions apply if using the AIPxxA/D audio input cards and the AOPxxA/D audio output cards.

### Audio Input Cards

The following input L/R channel pairs are available when using the AIPxxA analog audio input cards:

L/R analog channel pairs available	AIPxxA card required to access channels
Channels 23 and 24	AIP32A
Channels 25 and 26	AIP32A
Channels 27 and 28	AIP32A
Channels 29 and 30	AIP32A
Channels 31 and 32	AIP32A
Additional <b>Left only</b> channels 1, 3, 5, 7, 9, 11, 13, 15, 17, 19 and 21 are also available	

**SIERRA VIDEO**

The following AES pairs are available when using the AIPxxD digital audio input cards:

AES pairs available ( <i>Channels</i> )	AIPxxD card required to access channels
AES pair 1 (1&2)	AIP08D/AIP16D/AIP32D
AES pair 3 (5&6)	AIP08D/AIP16D/AIP32D
AES pair 5 (9&10)	AIP08D/AIP16D/AIP32D
AES pair 7 (13&14)	AIP08D/AIP16D/AIP32D
AES pair 9 (17&18)	AIP16D/AIP32D
AES pair 11 (21&22)	AIP16D/AIP32D
AES pair 13 (25&26)	AIP16D/AIP32D
AES pair 15 (29&30)	AIP16D/AIP32D
AES pair 17 (33&34)	AIP32D
AES pair 19 (37&38)	AIP32D
AES pair 21 (41&42)	AIP32D
AES pair 23 (45&46)	AIP32D
AES pair 24 (47&48)	AIP32D
AES pair 25 (49&50)	AIP32D
AES pair 26 (51&52)	AIP32D
AES pair 27 (53&54)	AIP32D
AES pair 28 (55&56)	AIP32D
AES pair 29 (57&58)	AIP32D
AES pair 30 (59&60)	AIP32D
AES pair 31 (61&62)	AIP32D
AES pair 32 (63&64)	AIP32D
Setting the router to MAP 1:1 gives access to the following two additional pairs:	
AES pair 20 (39&40)	AIP32D
AES pair 22 (43&44)	AIP32D

## Audio Output Cards

The following output L/R channel pairs are available when using the AOPxxA analog audio output cards:

L/R analog channel pairs available	AOPxxA card required to access channels
Channels 23 and 24	AOP32A
Channels 25 and 26	AOP32A
Channels 27 and 28	AOP32A
Channels 29 and 30	AOP32A
Channels 31 and 32	AOP32A
Additional <b>Left only</b> channels 1, 3, 5, 7, 9, 11, 13, 15, 17, 19 and 21 are also available	

**SIERRA VIDEO**

The following AES pairs are available when using the AOPxxD digital audio output cards:

AES pairs available ( <i>Channels</i> )	AOPxxD card required to access channels
AES pair 1 (1&2)	AIP08D/AOP16D/AOP32D
AES pair 3 (5&6)	AOP08D/AOP16D/AOP32D
AES pair 5 (9&10)	AOP08D/AOP16D/AOP32D
AES pair 7 (13&14)	AOP08D/AOP16D/AOP32D
AES pair 9 (17&18)	AOP16D/AOP32D
AES pair 11 (21&22)	AOP16D/AOP32D
AES pair 13 (25&26)	AOP16D/AOP32D
AES pair 15 (29&30)	AOP16D/AOP32D
AES pair 17 (33&34)	AOP32D
AES pair 19 (37&38)	AOP32D
AES pair 21 (41&42)	AOP32D
AES pair 23 (45&46)	AOP32D
AES pair 24 (47&48)	AOP32D
AES pair 25 (49&50)	AOP32D
AES pair 26 (51&52)	AOP32D
AES pair 27 (53&54)	AOP32D
AES pair 28 (55&56)	AOP32D
AES pair 29 (57&58)	AOP32D
AES pair 30 (59&60)	AOP32D
AES pair 31 (61&62)	AOP32D
AES pair 32 (63&64)	AOP32D

## Appendix D: Firmware Updates on the MPX-NET and MPX-MVC Main Cards

### Procedure for Updating Firmware

Performance enhancements, new features and bug fixes to the MV system are carried out by firmware updates to the **MPX-NET** and **MPX-MVC** main cards as appropriate. The procedure is simple, as shown by the following example where both cards are to be updated.

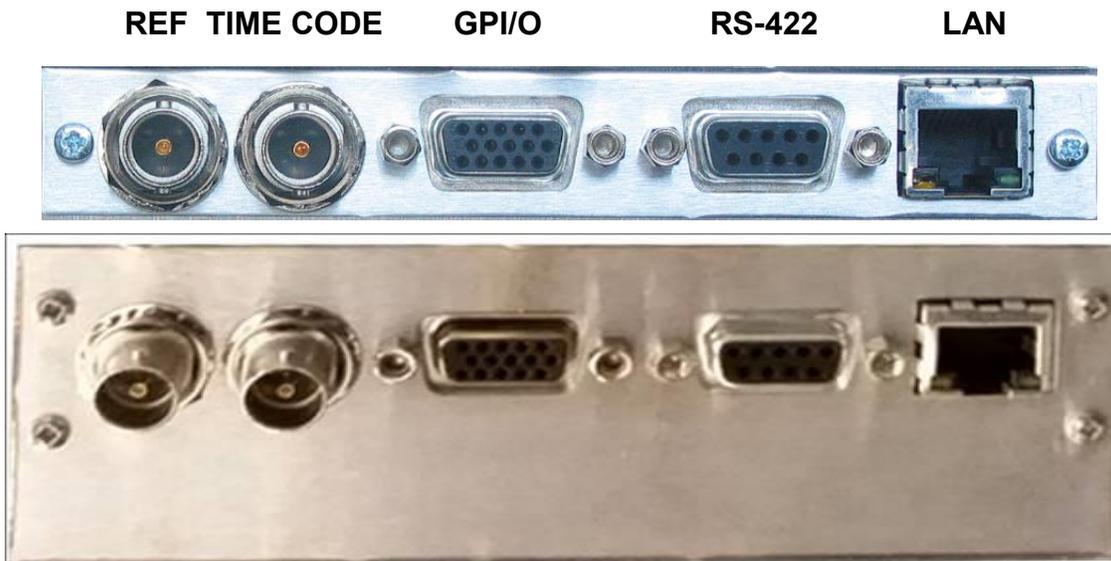
**Note:**

As well as accessing the MV GUI, the LAN port on the **RMP-MVC** connector panel is used to update the firmware on the MPX-MVC card **AND** the cards that it manages (e.g. VIP, AIPxxA/D etc.). The MPX-MVC card updates these as necessary after its own firmware is updated).

The MPX-MVC card does **NOT** update the MPX-NET main card. The LAN port on the **RMP-NET** connector panel needs to be used to update the MPX-NET card.

Hence, to update both the MPX-MVC and MPX-NET main cards, access to both ports is required, either via two separate connections or by updating each card in turn.

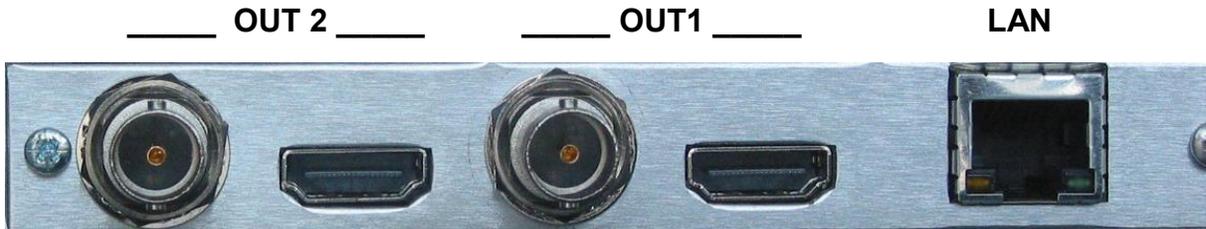
On the **RMP-NET** connector panel, the LAN port is the connector on the far right as shown in the images below of the 1RU and 3RU MV versions (When operational in the 3RU MV, the RMP-NET connector panel is vertical with the LAN port at the bottom).



*1RU and 3RU RMP-NET connector panel connections*

## SIERRA VIDEO

Likewise, for the **MPX -MVC** connector panel (same connector panel is used on the 1RU and 3RU MultiViewers), the LAN port is the connector on the far right as shown in the following image (When operational in the 3RU MV, the RMP-MVC connector panel is vertical with the LAN port at the bottom).



*RMP-MVC connector panel connections*

You then need to identify the IP address for each card you are going to update. The MV is supplied with the factory default IP addresses:

**MPXNET** card: 192.168.0.120.

**MPXMVC** card: 192.168.0.121

If you are unsure of the IP addresses, they can be checked or changed using the front panel OLED display:

Initially the display should be indicating the status. Rotate the knob until the desired network settings menu page is shown. For the NET card the first line is:

**MPXNET IP Address**, followed by 3 lines with the IP address, Netmask, and Gateway settings.

For the MVC card the first line is:

**1:SMP-MV-08 IP Address** (where the 1: at the beginning varies, indicating the slot number of the MVC card, and the name following this varies depending on whether the frame is an SMP or MP and the number of video inputs in the system). This is followed by 3 lines indicating the IP address, Netmask, and Gateway settings.

Push the scroll knob once to put the menu into **item scroll** mode. The first item that can be edited on the current menu page gets highlighted, and from there rotating the knob scrolls through the rest of the items on the page, highlighting one at a time. Scroll to the section of the IP address that needs to be changed.

Push the knob again to put the menu into **edit mode** - the currently selected item starts flashing and by turning the knob its value gets changed.

## SIERRA VIDEO

Push the knob again to exit **edit mode** and save the item just edited. The menu page is then back in **item scroll** mode. If more items on the page need to be changed scroll to them and repeat step 3, or exit **item scroll** mode by pushing the knob on the item that has just been changed. (Just leaving the knob alone for 30 seconds exits the menu, and goes back to the status page).

Uploading new firmware files is then achieved using a computer connected to the RMP-MVC connector panel or RMP-NET connector panel LAN ports directly, or over a network as follows:

1. Establish communication with the card to be upgraded by using Windows Explorer or a FTP client, such as WinSCP (**either the default addresses listed above or whatever the current IP address has been set to**).

---

**Note:**

The IP addresses of the frame and the computer must be in the same range. If necessary, the IP address of the card can be changed as described previously.

2. The FTP client username is **root**, password is **smv** for either card.
  - a) If using Windows Explorer, the procedure for logging in is as follows:
    - i. In the Folder bar at the top of Windows Explorer enter:  
**ftp://root@192.168.0.121** (or the appropriate IP address)
    - ii. Windows Explorer then requests a password:
    - iii. Enter **smv** in the Password field and press the Log On button.

A listing of the files on the MPX-MVC or MPX-NET cards (depending on which you're connected to) should now be displayed.

- iv. Proceed to step 3.
  - b) If using WinSCP or a similar FTP client then use its Login window to connect to the MPX-MVC or MPX-NET card.
3. Transfer the new mpxnet... file to the IP address of the MPX-**NET** card. Transfer new **mpxmvc...** file to the IP address of the MPX-**MVC** card.

Make sure the file gets transferred to the folder being viewed in the FTP client (/root folder), NOT any of the sub-folders that can be seen there (logos, layouts etc.)

4. **WAIT FOR AT LEAST 10 SECONDS AFTER A FILE TRANSFER HAS COMPLETED.**

---

**Note:**

The GUI can be used to reboot the MPX-MVC card if this is the only card that has been updated. However, if the MPX-NET card has been updated, the MV must be power cycled, **so after the 10 seconds, power the frame off and back on.**

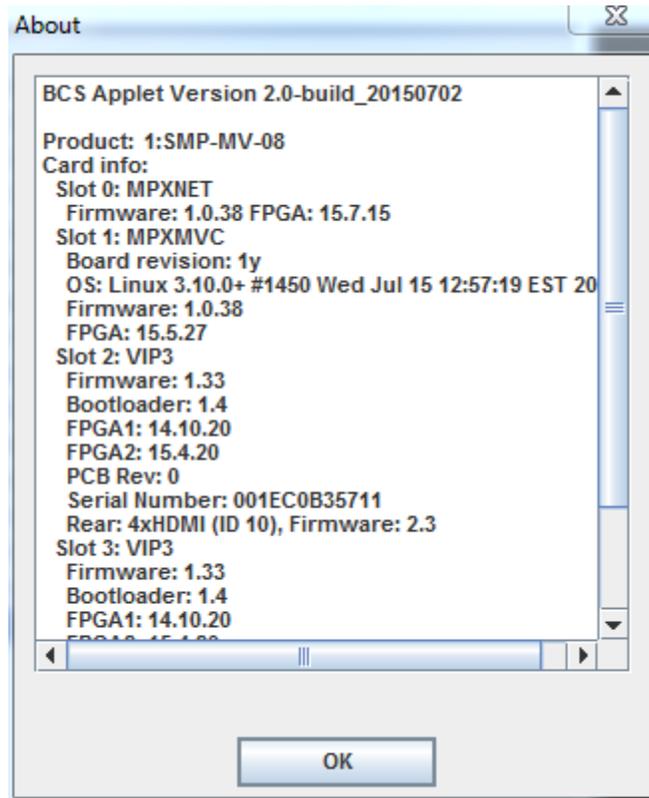
## SIERRA VIDEO

5. After the front display exits its **BOOTING...** indication, it says **UPDATING FIRMWARE**. It remains in that state for a few minutes. After that it should say **DETECTING HARDWARE**, and it takes another few minutes before the update has completed and you see anything on the video output.

Once the MV is up and running, in the GUI go to:

### Help > About

You should be able to see the latest firmware versions running on each card. In the example shown in the following screen shot, the **MPXMVC** and **MPXNET** card are both running **Firmware: 1.0.38**:



## Appendix E: Audio Card Configuration

### Audio Input Cards

The MV audio input cards are available in three formats:

- **Analog** only - AIPxxA
- **Digital** only - AIPxxD
- **Analog and digital** - AIP32AD

They also come in various channel capacities to allow for system flexibility:

Analog audio input card	Max. no. of channels supported	Digital audio input card	Max. no. of AES pairs supported ( <i>Channels</i> )
<b>AIP08A</b>	8	<b>AIP08D</b>	8 (16)
<b>AIP16A</b>	16	<b>AIP16D</b>	16(32)
<b>AIP32A</b>	32	<b>AIP32D</b>	32(64)
An <b>AIP32AD</b> card is also available able to handle 16 analog channels and 16 AES pairs (32 <i>digital channels</i> ) on a single card for users with space constraints. Custom analog/digital splits are available on request.			

---

**Note:**

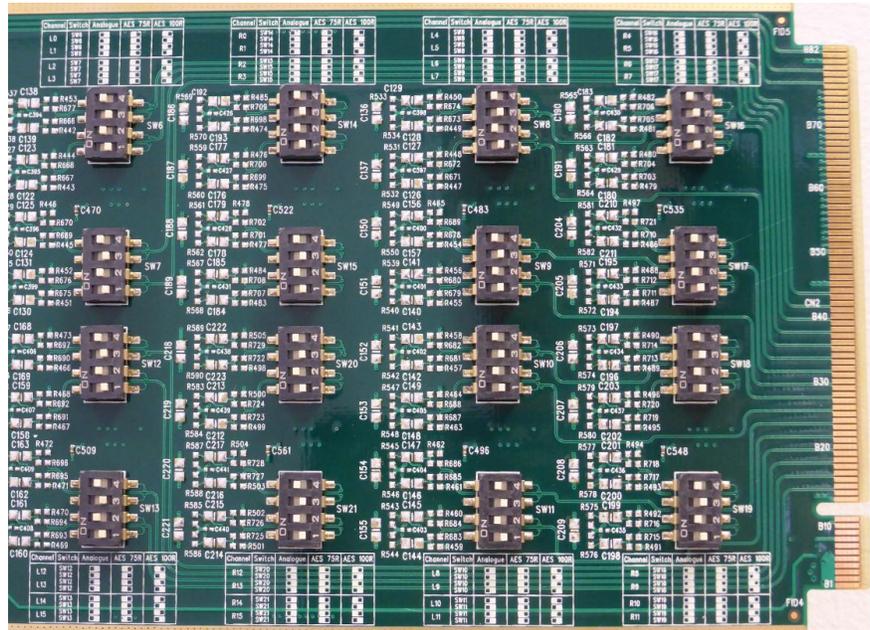
Digital audio cards have twice the effective channel capacity of analog cards because digital audio is transmitted as AES pairs comprising two discreet channels (though these are often just the left and right stereo components).

Several user selectable options are available depending on the card type:

- **AIPxxA** – Analog only audio input cards have **NO user selectable options**.
- **AIPxxD** – Digital only audio input cards have **user selectable balanced (100R)/un-balanced (75R) input terminations**. On the underside of an AIPxxD card you find one switch per two AES pairs supported by that particular card i.e. for an AIP32D card there would be **sixteen** switches fitted.

## SIERRA VIDEO

The following image shows all sixteen switches fitted to an AIP32D card. The **Audio input switch reference tables** at the end of this section identifies which switches are associated with which AES pair e.g. using the second table, AES pairs 29 and 31 are associated with SW13, which can be seen in the bottom left-hand corner of this image.



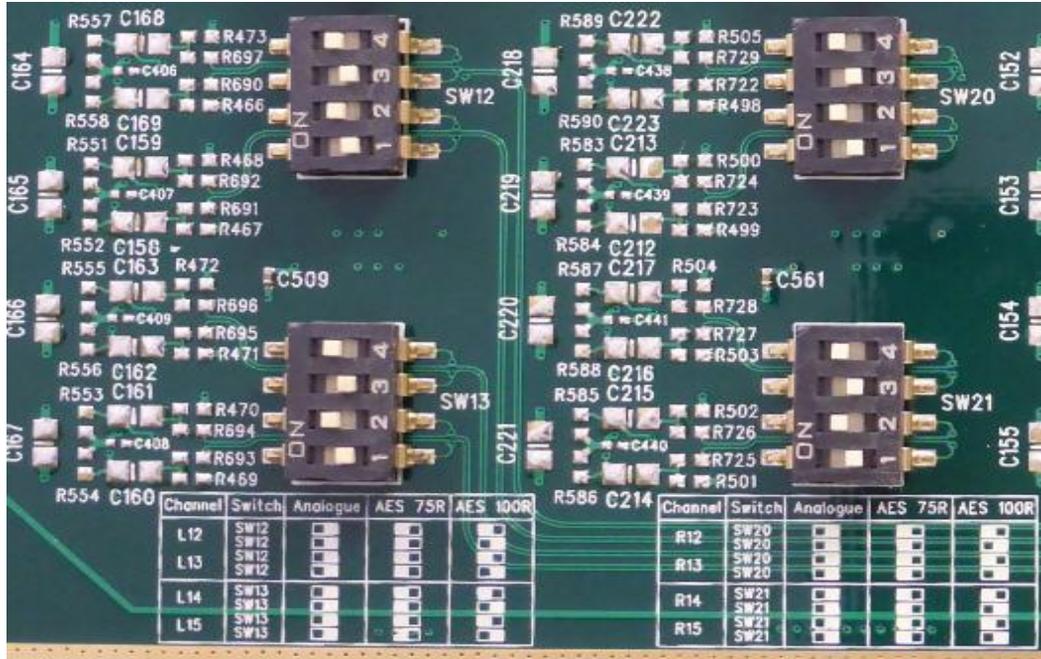
*AIP32D 16x audio input balanced(100R)/un-balanced (75R) termination selection switches (SWxx)*

Zooming in on SW13, a table can be seen silk screened underneath it indicating how to set the switches for **AES 75R** (un-balanced) or **AES 100R** (balanced) input terminations

**Note:**

The **Analog** setting **only** applies to the **AIP32AD** card detailed in the next section and if set to this position with an **AIPxxD** digital only input card, could result in a loss of the input signal as the inputs are not terminated correctly.

## SIERRA VIDEO



*AIP32D AES pairs 29 (L14) and 31 (L15) set to balanced (100R) impedance via SW13*

Comparing the table underneath SW13 with the position of the sliders on the switch, they can be seen as being set in the **AES 100R** position (as are all the switches in the image).

**Note:**

For AES transmission:

**75ohm single ended terminations (un-balanced)** are often used by consumer audio equipment and usually output via a phono socket.

**100(110) ohm differential terminations (balanced)** are mainly used by professional audio sources and often output via a XLR socket.

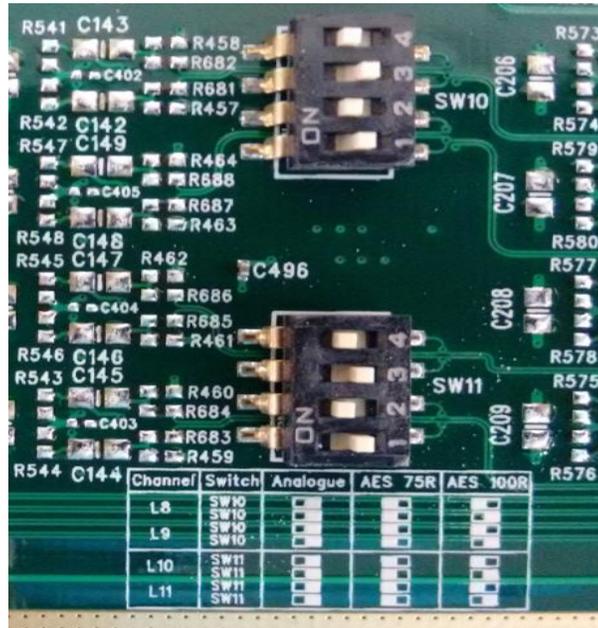
- **AIP32AD** – Analog and digital audio input cards have **user selectable analog or digital processing for each input plus the choice of balanced/un-balanced input terminations for all inputs set as digital.**

On the underside of an AIP32AD card you find sixteen switches, with one switch per two input signals just like the AIP32D described previously.

In order to set up any of the sixteen possible inputs up as either an analog input or digital with balanced/un-balanced terminations, first use the **Audio input switch reference tables** to identify the appropriate selector switch e.g. the second table shows audio input signals 21 (L10) and 23 (L11) are associated with SW11.

**SIERRA VIDEO**

If you want inputs 21 and 23 both to be analog, then move all four sliders over to the right as indicated in the **Analog** column in the table directly underneath SW11 in the image below. If you would like them to be set-up as balanced (100R) digital inputs, then set the sliders as shown i.e. as under the **AES 100R** column, Similarly, if the input impedance need to be set to un-balanced, set the slider positions as in the **AES 75R** column.



*AIP32AD AES pairs 21 (L10) and 23 (L11) set to balanced (100R) impedance via SW11*

Analog (Ch) or Digital AES pair IN <i>(ident on PCB table)</i>	Analog	AES 75R	AES 100R
Ch 1/AES pair 1 (L0)	SW6 position 4 OFF SW6 position 3 OFF	SW6 position 4 ON SW6 position 3 ON	SW6 position 4 ON SW6 position 3 OFF
<b>Ch 2/AES pair 2 (R0)</b>	<b>SW14 position 4 OFF</b> <b>SW14 position 3 OFF</b>	<b>SW14 position 4 ON</b> <b>SW14 position 3 ON</b>	<b>SW14 position 4 ON</b> <b>SW14 position 3 OFF</b>
Ch 3/AES pair 3 (L1)	SW6 position 2 OFF SW6 position 1 OFF	SW6 position 2 ON SW6 position 1 ON	SW6 position 2 ON SW6 position 1 OFF

**SIERRA VIDEO**

<b>Ch 4/AES pair 4 (R1)</b>	<b>SW14 position 2 OFF</b> <b>SW14 position 1 OFF</b>	<b>SW14 position 2 ON</b> <b>SW14 position 1 ON</b>	<b>SW14 position 2 ON</b> <b>SW14 position 1 OFF</b>
Ch 5/AES pair 5 (L2)	SW7 position 4 OFF SW7 position 3 OFF	SW7 position 4 ON SW7 position 3 ON	SW7 position 4 ON SW7 position 3 OFF
<b>Ch 6/AES pair 6 (R2)</b>	<b>SW15 position 4 OFF</b> <b>SW15 position 3 OFF</b>	<b>SW15 position 4 ON</b> <b>SW15 position 3 ON</b>	<b>SW15 position 4 ON</b> <b>SW15 position 3 OFF</b>
Ch 7/AES pair 7 (L3)	SW7 position 2 OFF SW7 position 1 OFF	SW7 position 2 ON SW7 position 1 ON	SW7 position 2 ON SW7 position 1 OFF
<b>Ch 8/AES pair 8 (R3)</b>	<b>SW15 position 2 OFF</b> <b>SW15 position 1 OFF</b>	<b>SW15 position 2 ON</b> <b>SW15 position 1 ON</b>	<b>SW15 position 2 ON</b> <b>SW15 position 1 OFF</b>
Ch 9/AES pair 9 (L4)	SW8 position 4 OFF SW8 position 3 OFF	SW8 position 4 ON SW8 position 3 ON	SW8 position 4 ON SW8 position 3 OFF
<b>Ch 10/AES pair 10 (R4)</b>	<b>SW16 position 4 OFF</b> <b>SW16 position 3 OFF</b>	<b>SW16 position 4 ON</b> <b>SW16 position 3 ON</b>	<b>SW16 position 4 ON</b> <b>SW16 position 3 OFF</b>
Ch 11/AES pair 11 (L5)	SW8 position 2 OFF SW8 position 1 OFF	SW8 position 2 ON SW8 position 1 ON	SW8 position 2 ON SW8 position 1 OFF
<b>Ch 12/AES pair 12 (R5)</b>	<b>SW16 position 2 OFF</b> <b>SW16 position 1 OFF</b>	<b>SW16 position 2 ON</b> <b>SW16 position 1 ON</b>	<b>SW16 position 2 ON</b> <b>SW16 position 1 OFF</b>
Ch 13/AES pair 13 (L6)	SW9 position 4 OFF SW9 position 3 OFF	SW9 position 4 ON SW9 position 3 ON	SW9 position 4 ON SW9 position 3 OFF
<b>Ch 14/AES pair 14 (R6)</b>	<b>SW17 position 4 OFF</b> <b>SW17 position 3 OFF</b>	<b>SW17 position 4 ON</b> <b>SW17 position 3 ON</b>	<b>SW17 position 4 ON</b> <b>SW17 position 3 OFF</b>
Ch 15/AES pair 15 (L7)	SW9 position 2 OFF SW9 position 1 OFF	SW9 position 2 ON SW9 position 1 ON	SW9 position 2 ON SW9 position 1 OFF
<b>Ch 16/AES pair 16 (R7)</b>	<b>SW17 position 2 OFF</b> <b>SW17 position 1 OFF</b>	<b>SW17 position 2 ON</b> <b>SW17 position 1 ON</b>	<b>SW17 position 2 ON</b> <b>SW17 position 1 OFF</b>

**SIERRA VIDEO**

**Table 2: AIPxxD and AIP32AD audio input card Channels/AES pairs 17-32 switch reference guide**

Analog (Ch) or Digital AES pair IN <i>(ident on PCB table)</i>	Analog 	AES 75R 	AES 100R 
Ch 17/AES pair 17 (L8)	SW10 position 4 OFF SW10 position 3 OFF	SW10 position 4 ON SW10 position 3 ON	SW10 position 4 ON SW10 position 3 OFF
<b>Ch 18/AES pair 18 (R8)</b>	<b>SW18 position 4 OFF</b> <b>SW18 position 3 OFF</b>	<b>SW18 position 4 ON</b> <b>SW18 position 3 ON</b>	<b>SW18 position 4 ON</b> <b>SW18 position 3 OFF</b>
Ch 19/AES pair 19 (L9)	SW10 position 2 OFF SW10 position 1 OFF	SW10 position 2 ON SW10 position 1 ON	SW10 position 2 ON SW10 position 1 OFF
<b>Ch 20/AES pair 20 (R9)</b>	<b>SW18 position 2 OFF</b> <b>SW18 position 1 OFF</b>	<b>SW18 position 2 ON</b> <b>SW18 position 1 ON</b>	<b>SW18 position 2 ON</b> <b>SW18 position 1 OFF</b>
Ch 21/AES pair 21 (L10)	SW11 position 4 OFF SW11 position 3 OFF	SW11 position 4 ON SW11 position 3 ON	SW11 position 4 ON SW11 position 3 OFF
<b>Ch 22AES pair 22 (R10)</b>	<b>SW19 position 4 OFF</b> <b>SW19 position 3 OFF</b>	<b>SW19 position 4 ON</b> <b>SW19 position 3 ON</b>	<b>SW19 position 4 ON</b> <b>SW19 position 3 OFF</b>
Ch 23/AES pair 23 (L11)	SW11 position 2 OFF SW11 position 1 OFF	SW11 position 2 ON SW11 position 1 ON	SW11 position 2 ON SW11 position 1 OFF
<b>Ch 24/AES pair 24 (R11)</b>	<b>SW19 position 2 OFF</b> <b>SW19 position 1 OFF</b>	<b>SW19 position 2 ON</b> <b>SW19 position 1 ON</b>	<b>SW19 position 2 ON</b> <b>SW19 position 1 OFF</b>
Ch 25/AES pair 25 (L12)	SW12 position 4 OFF SW12 position 3 OFF	SW12 position 4 ON SW12 position 3 ON	SW12 position 4 ON SW12 position 3 OFF
<b>Ch 26/AES pair 26 (R12)</b>	<b>SW20 position 4 OFF</b> <b>SW20 position 3 OFF</b>	<b>SW20 position 4 ON</b> <b>SW20 position 3 ON</b>	<b>SW20 position 4 ON</b> <b>SW20 position 3 OFF</b>
Ch 27/AES pair 27 (L13)	SW12 position 2 OFF SW12 position 1 OFF	SW12 position 2 ON SW12 position 1 ON	SW12 position 2 ON SW12 position 1 OFF

**SIERRA VIDEO**

<b>Ch 28/AES pair 28 (R13)</b>	<b>SW20 position 2 OFF</b> <b>SW20 position 1 OFF</b>	<b>SW20 position 2 ON</b> <b>SW20 position 1 ON</b>	<b>SW20 position 2 ON</b> <b>SW20 position 1 OFF</b>
Ch 29/AES pair 29 (L14)	SW13 position 4 OFF SW13 position 3 OFF	SW13 position 4 ON SW13 position 3 ON	SW13 position 4 ON SW13 position 3 OFF
<b>Ch 30/AES pair 30 (R14)</b>	<b>SW21 position 4 OFF</b> <b>SW21 position 3 OFF</b>	<b>SW21 position 4 ON</b> <b>SW21 position 3 ON</b>	<b>SW21 position 4 ON</b> <b>SW21 position 3 OFF</b>
Ch 31/AES pair 31 (L15)	SW13 position 2 OFF SW13 position 1 OFF	SW13 position 2 ON SW13 position 1 ON	SW13 position 2 ON SW13 position 1 OFF
<b>Ch 32/AES pair 32 (R15)</b>	<b>SW21 position 2 OFF</b> <b>SW21 position 1 OFF</b>	<b>SW21 position 2 ON</b> <b>SW21 position 1 ON</b>	<b>SW21 position 2 ON</b> <b>SW21 position 1 OFF</b>

## Audio Output Cards

The MV audio output cards are available in two formats:

- **Analog** only - AOPxxA
- **Digital** only - AOPxxD

They also come in various channel capacities to allow for system flexibility:

Analog audio output card	Max. no. of channels supported	Digital audio output card	Max. no. of AES pairs supported ( <i>Channels</i> )
<b>AOP08A</b>	8	<b>AOP08D</b>	8 (16)
<b>AOP16A</b>	16	<b>AOP16D</b>	16(32)
<b>AOP32A</b>	32	<b>AOP32D</b>	32(64)

Several user selectable options are available depending on the card type:

- **AOPxxA** – Analog only audio output cards have **NO user selectable options**.
- **AOPxxD** – Digital only audio output cards have **user selectable balanced (100R)/un-balanced (75R) input terminations**. On the underside of an AOPxxD card you find two three position pin headers per AES pair supported by that particular card i.e. for an AOP32D card there would be **thirty two** pin header pairs.

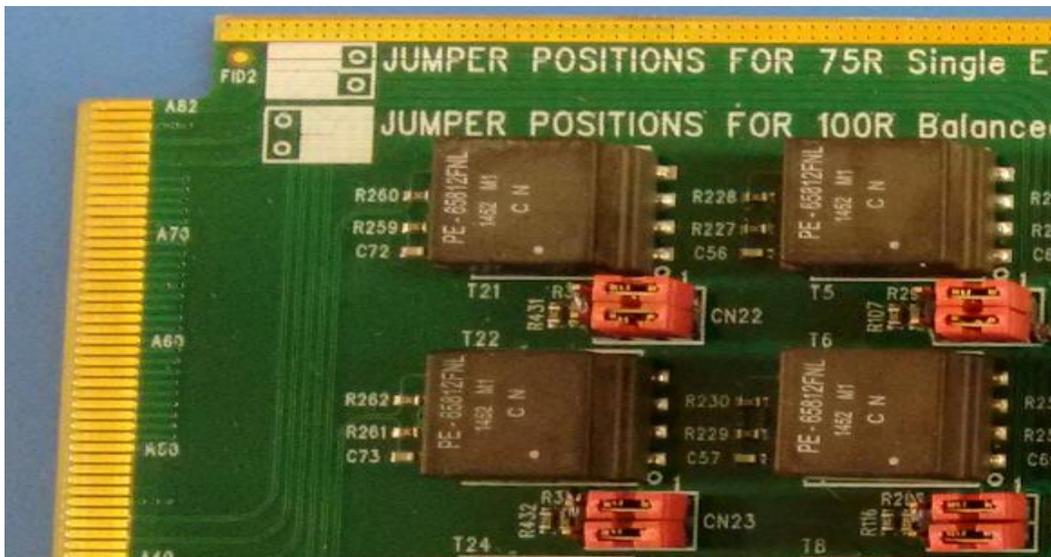
## SIERRA VIDEO

The following image shows all thirty two header pairs switches fitted to an AIP32D card. The **Audio output pin header reference table** at the end of this section identifies which pin headers are associated with which AES pair e.g. from the table AES pair 10 is associated with pin header CN22, which can be seen in the top left-hand corner of this image.



*AOP32D 32x digital audio output balanced(100R)/un-balanced (75R) termination selection pin headers (CNxx)*

Zooming in on CN22, a schematic guide can be seen silk-screened on the top left-hand corner of the PCB indicating how to set the headers for **AES 75R** (un-balanced) or **AES 100R** (balanced) output terminations.



*AOP32D AES pair 10 set to balanced (100R) impedance via pin header CN22*

**SIERRA VIDEO**

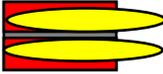
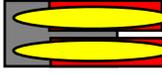
Comparing the impedance guide with the position of the jumpers on CN22, they can be seen as being set in the **AES 100R** position (as are all the pin header jumpers in the image).

**Note:**

For AES transmission:

**75ohm single ended terminations (un-balanced)** are often used by consumer audio equipment and usually output via a phono socket.

**100(110) ohm differential terminations (balanced)** are mainly used by professional audio sources and often output via a XLR socket.

<b>Table 3: AOPxxD digital audio output card pin header reference guide</b>			
For all headers:  75ohm single ended  100ohm balanced			
Digital audio OUT <b>AES pairs 1 - 16</b>	PCB header	Digital audio OUT <b>AES pairs 17 - 32</b>	PCB header
AES pair 1	CN2	AES pair 17	CN10
<b>AES pair 2</b>	<b>CN18</b>	<b>AES pair 18</b>	<b>CN26</b>
AES pair 3	CN3	AES pair 19	CN11
<b>AES pair 4</b>	<b>CN19</b>	<b>AES pair 20</b>	<b>CN27</b>
AES pair 5	CN5	AES pair 21	CN13
<b>AES pair 6</b>	<b>CN21</b>	<b>AES pair 22</b>	<b>CN29</b>
AES pair 7	CN4	AES pair 23	CN12
<b>AES pair 8</b>	<b>CN20</b>	<b>AES pair 24</b>	<b>CN28</b>
AES pair 9	CN6	AES pair 25	CN14
<b>AES pair 10</b>	<b>CN22</b>	<b>AES pair 26</b>	<b>CN30</b>
AES pair 11	CN7	AES pair 27	CN15
<b>AES pair 12</b>	<b>CN23</b>	<b>AES pair 28</b>	<b>CN31</b>

**SIERRA VIDEO**

AES pair 13	CN9	AES pair 29	CN17
<b>AES pair 14</b>	<b>CN25</b>	<b>AES pair 30</b>	<b>CN33</b>
AES pair 15	CN8	AES pair 31	CN16
<b>AES pair 16</b>	<b>CN24</b>	<b>AES pair 32</b>	<b>CN32</b>

## Appendix F: HDMI Cable Retention

### The HDMI Interface

With the ability to carry high resolution video and embedded audio, HDMI connectors are the de-facto interface standard for consumer video equipment. Increasingly, they are also becoming prevalent in professional video production. The MV system offers a number of connector panels with Type A (the largest/most popular) HDMI interfaces. However, unlike the BNC connector, HDMI connectors are typically non-locking and can be easily dislodged when fitted.

### Kramer K-Lock Cables

A notable exception to this rule is Kramer. Kramer cables employ K-Lock Pull-Resistant Connectors to overcome this non-locking issue. K-Lock provides 15lbs of restraining force for a non-slip connection. The K-Lock HDMI connectors feature flanges on the underside and sides of the HDMI connector to provide friction to prevent the cables simply falling out under gravitational pull.



*Kramer HDMI cables with K-Lock connectors*

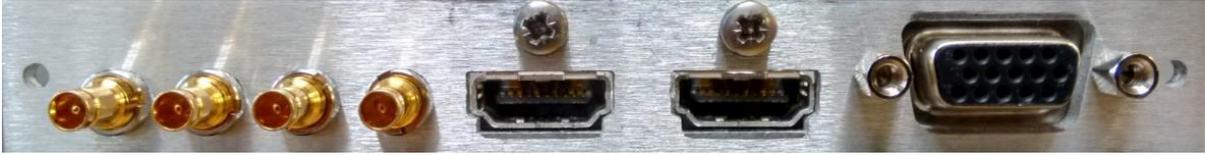
---

**Note:**

With K-lock and other friction style connectors, insertion is normally done as with any HDMI connector, but in the case of other non-Kramer cables, removal may require the locking mechanism to be released by squeezing or sliding as appropriate.

For instances where Kramer cables are not used, all MV HDMI connector panels have a number of features designed to allow an HDMI connector to be securely retained.

The HDMI receptacles fitted to all MV HDMI connector panels have a recessed flange fitted into which an M3 screw can be located. This flange sits directly behind the connector panel metalwork and the image below shows an **RMP-HM2 connector panel** which has an M3 screw fitted through the connector panel and into each of the receptacles. This ensures the receptacles have high mechanical strength and are not likely to be dislodged from the PCB if any mating HDMI connector is subjected to excessive sideways force.



*MV HM2 HDMI connectors with retaining screw fitted*

Increasing the mechanical rigidity of the HDMI receptacles allows the reliable use of 'locking' HDMI connectors or a retention bracket for traditional non-locking HDMI connectors.

## **HDMI Connector with Integral Screw Fitting**

Other solutions are available where a mating HDMI connector can be held in place, using a screw. To use this type of connector, remove the M3 screw fitted to the appropriate receptacle on the MV connector panel, insert this connector and tighten the thumb screw so that it goes through the hole in the connector panel and locates into the threaded flange.

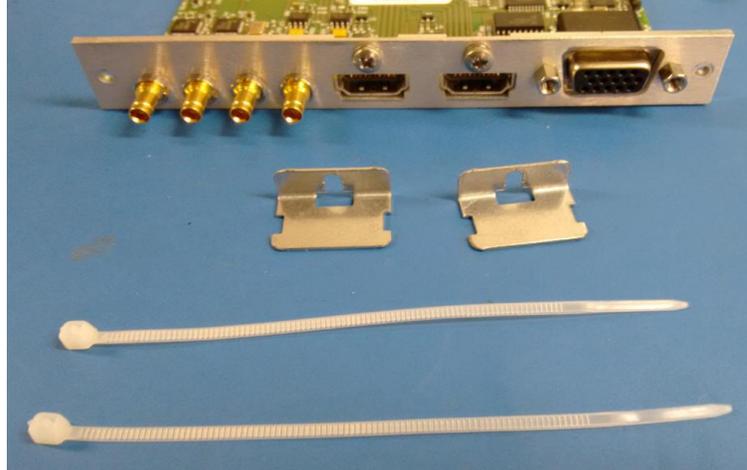


*HDMI connector with integral screw-fitting*

**Note:** To use this solution, the locking screw must be M3 and sit  $8 \pm 0.25$ mm from the centre-line of the HDMI connector.

## Traditional HDMI Mating Connectors

Every MV connector panel fitted with HDMI receptacles is supplied with an H-Lok bracket for receptacle. The following image shows the two H-Lok brackets supplied with an **RMP-HM2** connector panel along with a tie-wrap each.



*RMP-HM2 connector panel supplied with 2x H-Lok brackets and tie-wraps*

To use an H-Lok bracket, follow these steps:

1. Remove the M3 screw above the required HDMI connector and place the H-Lok bracket as shown in the image below and replace the M3 screw. Tighten the M3 screw so that H-Lok bracket is held in place but can still be moved up and down. Fit an HDMI cable into place and adjust the H-Lok so that it rests lightly on top of the HDMI connector shell and then tighten the M3 screw so that the bracket can no longer move up or down (**DOESN'T** need to be too tight!).



*H-Lok bracket resting lightly on top of an HDMI connector shell*

## SIERRA VIDEO

2. Place a tie-wrap around the H-Lok and HDMI connector shell and pull the tie-wrap finger tight as shown in the image below. This should securely hold the cable to the connector panel, even if the cable is accidentally knocked.



*Tie-wrap securely holds the inserted HDMI connector to the H-Lok bracket*

3. The slot cut into the back of the H-Lok allows it to accommodate HDMI connector shells of varying size side-by-side.



*Differing HDMI connector shell sizes can be easily accommodated*

## Appendix G: MV HDMI and SDI Video Output Standards

The following table summarises the video standards available from the two independent HDMI (or DVI) output connectors on the **RMP-MVC** (or **RMP-DVI**) connector panel along with the corresponding outputs on each of their slaved SDI connections.

Video outputs: 2 x independent HDMI each with a slaved SDI output	HDMI output	With embedded audio	Slaved SDI output	With embedded audio
720p50 (1280x720@50Hz)	☐	☐	☐	☐
720p59.94 (1280x720@59.94Hz)	☐	☐	☐	☐
720p60 (1280x720@60Hz)	☐	☐	☐	☐
1080p50 (1920x1080@50Hz)	☐	☐	☐	☐
1080p59.94 (1920x1080@59.94Hz)	☐	☐	☐	☐
1080p60 (1920x1080@60Hz)	☐	☐	☐	☐
XGA (1024x768@60Hz)	☐			
SXGA+ (1400x1050@60Hz)	☐			
1600x1200@60Hz	☐			

Processing delay varies from 2-3 fields for interlaced video inputs, 2-3 frames for progressive video inputs, depending on timing relationship between the input and output.

## Appendix H: Connector Panel Identification

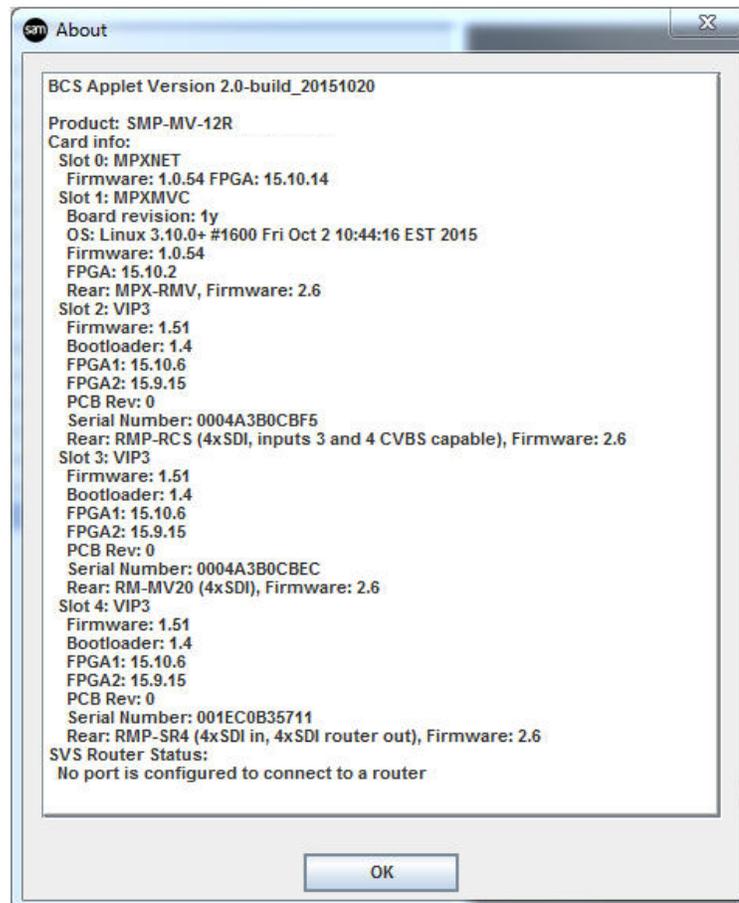
Due to the high connector count on the majority of connector panels, silk screening meaningful information on to the metalwork is very difficult. However, there are several ways to identify what connector panels have been fitted to an MV chassis.

- A full description and photograph of each connector panel can be found in the **Connector I/O** section towards the front of the manual.
- A more concise list of available connector panels and their capabilities is detailed in the **Summary of connector panel connector modules** table.
- The easiest way though, to identify the connector panels on a working MV chassis, is to use the MV web browser interface (GUI) which can be used to show what connector panels have been fitted along with a brief description of the connector I/O available for that connector panel.

Once the MV is up and running, in the browser interface go to:

**Help > About**

You should then be able to see something very similar to the example below:



## **SIERRA VIDEO**

For all active slots, except Slot 0, both the main card and connector panel fitted are identified along with the firmware revision they are running. In the case of Slot 0, which can only accept a MPX-NET main card and a RMP-NET connector panel, only the firmware revision of the main card is shown.

In the other slots, the connector panels have been identified along with a brief description of the connector I/O functionality. In the example screen shot, the following connector panels have been identified as fitted to a SMP-MV-12R chassis:

- Slot 1: **RMP-MVC**
- Slot 2: **RMP-RCS**
- Slot 3: **RMP-SD4**
- Slot 4: **RMP-SR4**