Imagine COMMUNICATIONS™

User Guide

DX Series
DX-16

Version 2.1

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User's Guide

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Zandar Technologies plc
TrioTech House, Abbey Road
Deansgrange, Co. Dublin
Ireland
Tel: +353-1-2808 945
Fax: +353-1-2808 956
Email: sales@zandar.com
Tech Support: +353-1-2808 945

Zandar Technologies plc
C/O Advanced Media Solutions, Inc
1970 E. Osceola Parkway, No. 330,
Kissimmee
FL 34743
USA
Tel: 321-939 0457
Fax: 321-939 0458
Tech Support: 949-597 1053
Tech Support Email: Tecads@home.com

Zandar web site: www.zandar.com

Contents

Introduction

The DX series of MultiViewer products enable the simultaneous display of multiple video sources in real time. The modular DX-16 MultiViewer is configurable from 8 to 12 to 16 input channels and is supplied as a 1RU 19" rack mount enclosure with a front LCD control panel.

A selection of preset layout/files are stored in the DX MultiViewer to output for display on video monitors, VGA screens or distribution on video networks. Changes to text and color-schemes can be made from the front panel. Each image can also be seen full screen or frozen. For full user configuration of display layouts, an optional Layout Editor package is available, Z_Editor (Option-LE).

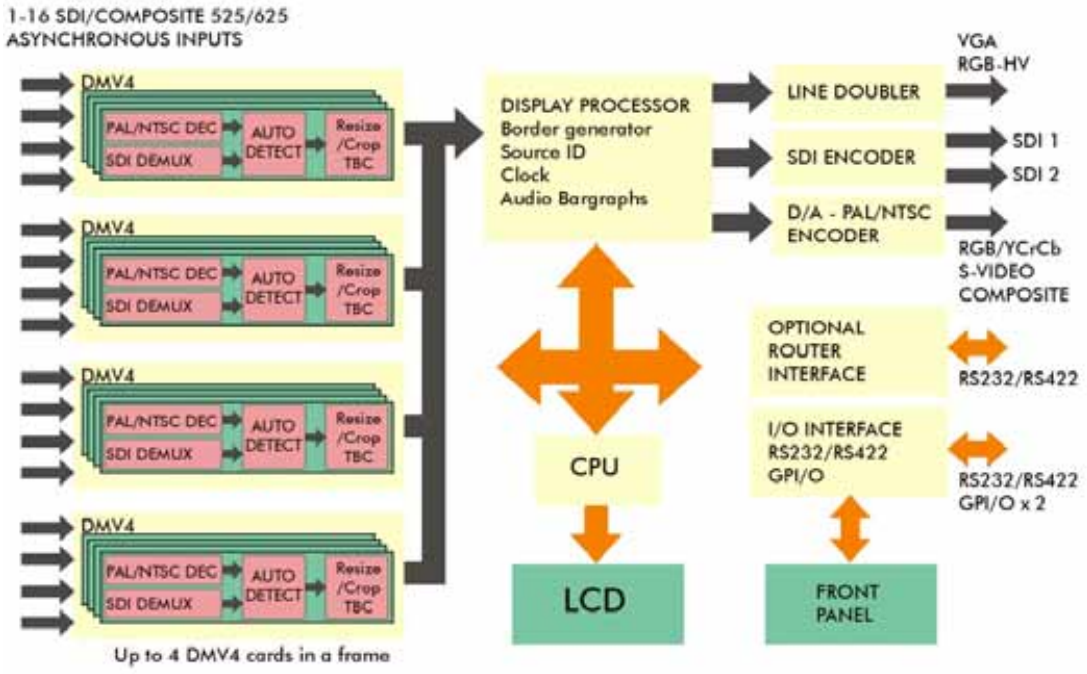

Figure 1: MultiViewer block diagram

On-screen audio bargraph support is available for embedded audio (Option-EA) and for external audio with the optional Zandar ZAM-32 In-Picture Audio Meter (Option-ZAM).

An optional plug-in Router Card allows serial router tally data to be displayed instead of locally generated PiP label text (Option-UMD).

Main features

- Up to 8, 12 or 16 asynchronous composite or SDI video sources (with autodetect)
- 525/625 and PAL/NTSC operation (autodetect per input)
- 8 Bit 4:2:2 internal processing and 10 bit DAC outputs
- SDI, Y/C, composite, or component outputs
- VGA output (built-in line doubler outputs progressive scan picture)
- Full screen and freeze on any input
- Built-in preset layouts
- Built-in character generator for source ID
- Standard or double on-screen font size
- Real-time clock and date
- Z_Editor option for full user configuration of layouts and 'Picture-in-Picture' layering
- Sync Loss Detect, Black Picture Detect and SDI Frozen Picture Detect
- 16 GPI alarm inputs and outputs
- GPO per PiP for any PiP alarm/Full Screen or remote trigger
- GPI recall of layouts
- GPI triggered tally/alarm indication via PiP border and or PiP label text color change, PiP change to full screen and/or red Tally Lamp
- On-screen bargaph monitoring of 2 or 4 embedded channels of audio per video source with licensed firmware upgrade
- External Zandar ZAM-32/24/16/8 option for configurable on-screen bargaph monitoring of external analog and digital audio with comprehensive alarms
- Up to three Tally Lamps with programmable colors via remote interface
- UMD information and tally status from external router via optional Router Interface
- Additional UMD available from Command Line Interface
- Front panel controls and LCD display
- RS232 and multidrop capable RS422 remote control

Applications

- Video server 'confidence channel'
- Broadcast video 'presence' monitoring
- Audio 'presence' and level monitoring
- Multi-channel monitoring in OB trucks/vans
- Master control rooms
- CATV/SMATV
- CCTV security and surveillance
- Multimedia kiosks
- Monitoring in industrial, educational, scientific and traffic environments
- Government applications

Display Layouts

Factory preset display layout/files have been provided which together allow 8 possible layout variations. In addition any PiP within a currently displayed layout can be instantly re-sized to full screen or frozen.

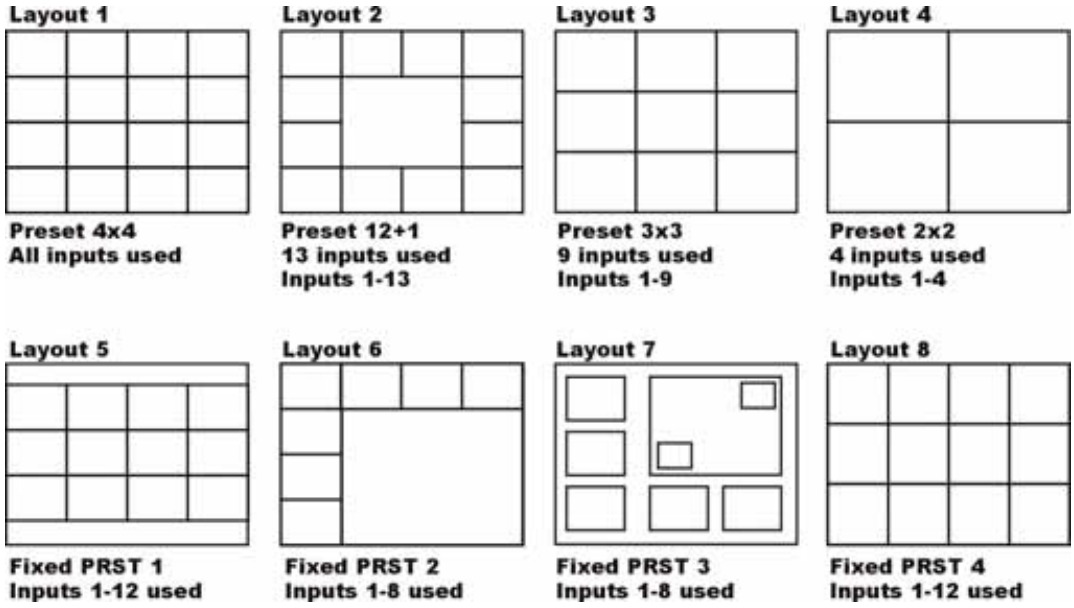

Figure 2: The DX-16 display variations

The upper row of four preset layouts have dedicated front control buttons, whilst the lower row of designs are obtained by repeated pressing of the PRST button. PRST 4 layout is intended for Wide Screen pictures.

Layouts and Settings

The front control panel can be used to apply layout settings to all the locally stored layouts by choosing 'Global Settings' for specific properties such as Labels, Borders, Captions or Clock. Changes can also be made to affect all layouts by using Global settings by remote control using the built-in remote control protocol.

The 'Z_Editor' Layout Editor provides total layout control and must be used to support unique properties for each layout. Z_Editor allows an unlimited number of layout/files to be created, some of which may be 'saved' to a front panel layout button. Z_Editor also supports layering for unlimited PiP overlapping.

Layout/File settings should be used instead of Global Settings if Z_Editor layout control is required.

Video and sync-loss alarms

The black and frozen picture alarms are complemented by the sync loss detection alarm.

Sync loss detection

The DX MultiViewer detects the loss of both analog sync and SDI timing information on PiP inputs. However, in systems where video syncs are restored a black picture can result even when sync information is still intact.

Black picture detection

Although program material may briefly include a black picture, video at black for a prolonged period is more likely to occur if there's been a equipment failure, a severed cable, a pulled plug, or if server switch hasn't happened as expected.

If the number of consecutive black frames exceeds a predetermined limit an alarm (BP) is shown on-screen. The threshold above which black is

detected is adjustable and there is provision to mask the effect of upstream logos.

Frozen picture detection (SDI only)

A frozen picture can occur if a server locks up or if a frame synchronizer or video delay loses its input. The number of consecutive frames where each frame has the same checksum is counted. If that number exceeds a predetermined limit an alarm (FP) is shown on-screen.

Audio Monitoring

Support for real-time on-screen audio-level meters and alarms is available for embedded audio with software upgrade, Option-EA and for external analogue and digital audio with the optional Zandar ZAM-32 In-Picture Audio Meter (Option-ZAM).

Two or four audio bars can be displayed in each PiP to monitor up to a maximum of 32 audio channels.

Router Interface

The DX-16 interfaces with external routers by emulating UMD and Tally functions using an optional plug-in router card (Option-UMD), which connects with an external router via RS232 or RS422/485.

UMD and Tally data can be displayed on-screen instead of a locally generated source ID or PiP label on a PiP by PiP basis.

The internal Router Option is programmed with the appropriate Router Protocol Interpreter software, which reads the UMD and Tally data from an external router.

Note: The Command Line Interface can support a total of two labels and three Tally Lamps and Tally can also be updated from the GPI.

Installation

Warnings

The following warnings are intended for user guidance and safety

Ground Before turning on the unit, you must connect the protective earth terminal of the unit to the protective conductor of the mains power cord. The mains plug shall only be inserted in a socket outlet provided with a protective earth contact.

Fuses Only fuses with the required rated current, voltage and specified type (quick blow) must be used. Do not use repaired fuses or short-circuited fuse holders.

Service Service instructions are for trained personnel. To avoid dangerous electric shock, do not perform any service unless qualified to do so.

Do not install substitute parts or perform any unauthorized modification to the unit.

These are solid state units with low supply voltage rails, however, mains voltages are present on certain parts of the unit. These parts are not accessible under normal operating conditions. There are no user serviceable parts within and only suitably qualified persons should carry out any repairs or modifications. The mains supply must be disconnected before removing any covers.

Ventilation The unit must have adequate ventilation to avoid overheating of components. Installation should be in standard 19" racks with forced air or convection cooling.

A DX MultiViewer may be initially configured as an 8, 12 or 16 input channel system. With the exception of the DX-4 Quad, field upgrades are available that add four inputs up to the maximum of 16 with the DMV4 daughter card.

Product Code	Channels	Upgradeable
DX-4 Quad	4	No
DX-8 MultiViewer	8	Yes
DX-12 MultiViewer	12	Yes
DX-16 MultiViewer	16	No

Table 1: DX Series configuration options

A standard DX MultiViewer comprises the following:

- 1RU 19" rack mount enclosure
- Rear Panel I/O
- Front panel with LCD and configurations buttons
- Motherboard with positions for 1-4 Video Cards and optional Router Card
- 1-4 Four input Video Cards (DMV4)
- 60 Watt switched mode auto sensing Power Supply Unit (PSU)

The following accessories are supplied:

- One IEC mains lead with plug
- One user's reference manual
- One RS232 cable

The following options are available:

- Option-LE Layout Editor - Z_Editor - user layout GUI software
- Option-EA Embedded Audio for on-screen bargaph monitoring of embedded audio
- Option-ZAM for calibrated on-screen bargaph monitoring of external analog and digital audio with comprehensive alarms
- Option-UMD Router Interface Software

Rack Installation

Install the DX Series MultiViewer in a standard 19 inch rack as follows:

- Mount in the rack and secure via the rack ears
- Allow at least 20mm space for the fan intakes on the left hand side panel and the fan extractors on the right hand side panel (viewed from front)
- Ensure adequate supply of cool air
- Power the unit by connecting the supplied power cord
- Connect appropriate video signals to the video in BNC connectors
- Connect VGA and video outputs as required
- Connect the controlling system to the RS232 D-type connector for remote control
- Refer to the Operation chapter for system and configuration settings and the Audio Monitoring chapter or ZAM/DX Quick Start Guide for help with connecting a ZAM In-Picture Audio Meter

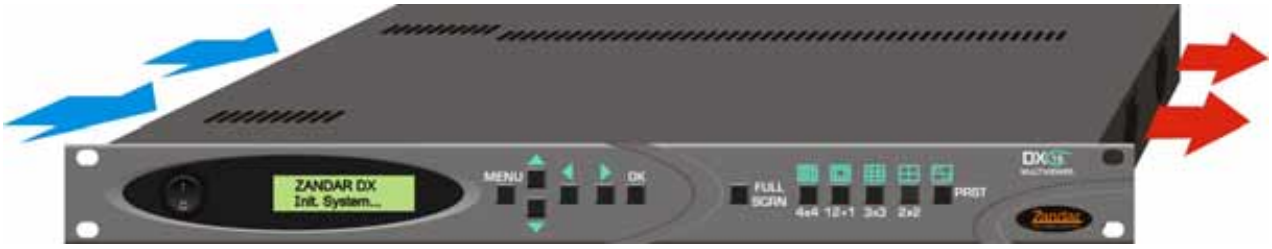

Figure 3: MultiViewer airflow diagram

Note: It is not necessary to keep the top and bottom air vents clear of obstruction provided the left and right hand fans are unobstructed and cool air is available at the air intake.

The DX-16 rear panel

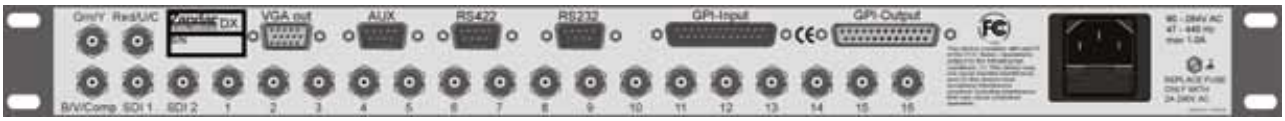

Figure 4: MultiViewer rear panel

Video inputs	16 auto sensing SDI/composite video BNC inputs labeled 1 – 16 and terminated with 75 Ohms.
Component video outputs	Three BNC connectors provide RGB, YUV, S-Video (Y/C) or composite video outputs. The format is software selectable via the front panel user interface. The factory default is S-Video (Y/C) and composite outputs.
Serial Digital video outputs	Two BNC connectors provide buffered outputs of the main SDI video output.
VGA output	The D-type labeled VGA-out provides a line doubled (non-interlaced), motion compensated VGA output. This output can drive a VGA monitor or data-resolution display device, such as a Plasma Display Panel.
Remote control	The RS232 and RS422 connectors provide industry standard communications ports to allow remote control of the system. Any IBM compatible PC-AT serial port or dumb terminal may be connected to either port to provide a Command Line Interface (CLI) for system configuration. Refer to the Command Protocol chapter for details. The port not used for the CLI may be used to connect a ZAM In-Picture Audio Meter to provide audio monitoring support.
AUX connector	This RS232 or RS422 (485) connector is reserved for use with the Router Option.
GPI-Input GPI-Output	The 25-way D-type MALE connector labeled GPI-Input provides 16 contact closure or TTL GPI alarm inputs. The 25-way D-type FEMALE connector labeled GPI-Output provides 16 open collector outputs.
Power	An auto sensing AC main power inlet with a fuse drawer is located on the rear panel. A spare fuse is located inside the fuse drawer. Only replace the fuse with a 2A 240AC fuse.

Connector pin-out

The following tables describe the DX I/O in detail:

3 assignable output BNC connectors

Format	Red/U/C BNC	Grn/Y BNC	B/V/Comp BNC
RGB	Red	Green	Blue
YUV (YCrCb)	V (Cr)	Y	U (Cb)
S-Video/Comp	S-Video Chroma	S-Video Luma	Composite

Table 2: Video output BNC assignments

Note: U and V outputs are wrongly labeled on the rear of the DX MultiViewer and should be swapped for correct colors.

Refer to channel upgrade section for fitting extra channels

	BNC 1-4	BNC 5-8	BNC 9-12	BNC 13-16
DMV4 fitted	1st DMV4	2nd DMV4	3rd DMV4	4th DMV4

Table 3: Video input BNC assignments

This RS232 port is configured to work with a NULL modem cable

Pin No	Function	Pin No	Function
1	NC	6	NC
2	RXD	7	NC
3	TXD	8	NC
4	NC	9	NC
5	GND		

Table 4: Male 9 way 'D' connector RS232 assignments

RS422 port configuration

Pin No	Function	Pin No	Function
1	NC	6	NC
2	RX-	7	RX+
3	TX+	8	TX-
4	NC	9	GND
5	GND		

Table 5: Male 9 way 'D' connector RS422 assignments

AUX port configured as RS232

Pin No	Function	Pin No	Function
1	NC	6	NC
2	RXD	7	NC
3	TXD	8	NC
4	NC	9	NC
5	GND		

Table 6: Male 9 way 'D' connector RS232 assignments

AUX port configured as RS422/485

Pin No	Function	Pin No	Function
1	NC	6	NC
2	RX-	7	RX+
3	TX+	8	TX-
4	NC	9	GND
5	GND		

Table 7: Male 9 way 'D' connector RS422/485 assignments

16 open collector outputs

GPO	Pin No	GPO	Pin No
GPO_0	1	GPO_8	5
GPO_1	14	GPO_9	18
GPO_2	2	GPO_10	6
GPO_3	15	GPO_11	19
GPO_4	3	GPO_12	7
GPO_5	16	GPO_13	20
GPO_6	4	GPO_14	8
GPO_7	17	GPO_15	21
GND	10,11,12,13, 22,23,24,25		

Table 8: Male 25 way 'D' connector GPO assignments

Note: The GPO can be set for normally open or normally closed.
GPO signals are mapped to PiPs; GPO_0 = PiP1, GPO_1 = PiP2, etc.

16 contact closure or TTL alarm inputs

GPI	Pin No	GPIO	Pin No
GPI_0	1	GPI_8	5
GPI_1	14	GPI_9	18
GPI_2	2	GPI_10	6
GPI_3	15	GPI_11	19
GPI_4	3	GPI_12	7
GPI_5	16	GPI_13	20
GPI_6	4	GPI_14	8
GPI_7	17	GPI_15	21
GND	10,11,12,13, 22,23,24,25		

Table 9: Female 25 way 'D' connector GPI assignments

Note: Pin 9 of each connector is not used.

Performing upgrades

The DX series of MultiViewers have an embedded processor that executes its own software stored in flash memory, which can be updated via a serial connection.

The update process is often referred to as In Application Programming. The Zandar Windows application (IAP.exe) allows software modules to be downloaded to the DX from a connected PC.

The DX unit must be setup in a special IAP Mode to support the download and a null-modem cable must be used to connect a spare RS232 port on the PC to COM 1 of the Controller on the DX unit.

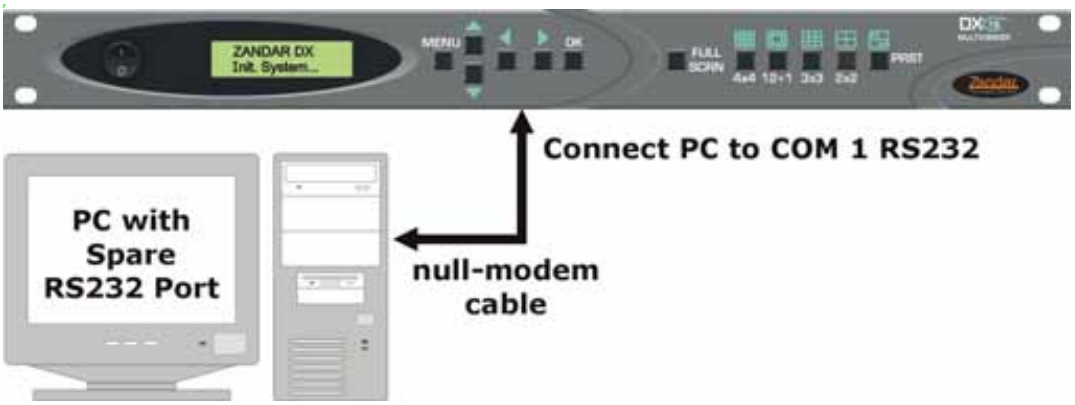

Figure 5: Serial control cabling

WARNING: Layouts stored on the DX will be lost after an upgrade and **MUST** be backed up externally using Z_Editor first.

To prepare for an IAP upgrade proceed as follows:

- Back up any existing layouts externally using Z_Editor
- Power down the PC and the DX unit
- Connect a null-modem cable between a spare PC RS232 com port and the RS232 COM 1 port of the DX unit
- Power up the DX unit with the MENU key held down to enter the IAP mode

The DX LCD will now display the following message:

Boot Loader 1.3 (or higher) *Download ready*

Note: A null-modem has pins 2 and 3 (Rx/Tx) crossed over.

The next step is to run IAP.exe on the PC. If this was received as a self-exploding compressed file it must first be installed onto the PC.

IAP will produce the following screen when it is run:

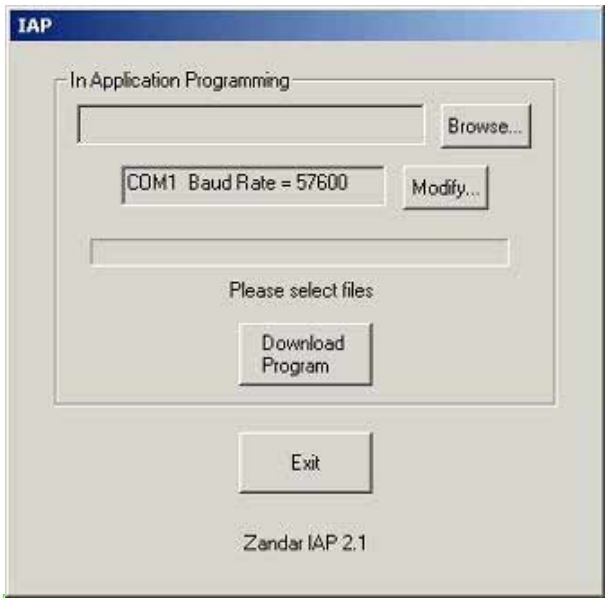

Figure 6: IAP menu

To continue with the download proceed as follows:

- Select an update file to download
- Ensure that the port selected is COM 1 and the baud rate is 57600
- Press download to begin the update

Note: If the IAP utility was installed to the default directory and the update file was included with the install, the required file will be of the form C:\IAP\ iX_YY.txt. Where X_YY is the update number or name.

During the update process, which may take up to 25 minutes to complete, a progress bar will appear in the IAP application window and a progress indicator will appear on the DX LCD display.

All user buttons are disabled during the update and the IAP EXIT button will not be available.

If there are multiple hex files in the upgrade, a status message will appear in the IAP application window to show completion of each stage. After all files have been updated, a status message will appear in the IAP application window indicating successful completion.

The DX LCD will display 'Download Ready' again.

Press EXIT in the IAP application when complete and re-power the DX unit.

The normal power-up sequence should be performed and a new version number displayed. If successful, any attached display should show the DX output as before.

If any errors were reported during this process, check the serial communications and retry the update. The trouble-shooting chapter may help with any error codes reported.

IMPORTANT: Factory defaults for the standard in use will need to be recalled to enable layouts to be configured correctly. **System Setup >> Factory Settings >> OK >> Recall >> PAL/NTSC/PALM/EXIT**.

Operation

The front panel user interface consists of 6 buttons and an LCD panel interface with a further six control buttons.

The controls allow the recall of factory and user layouts, the addition of borders, clock, user configurable ID data, GPI/O and RS232/422 serial control.

Figure 7: MultiViewer front panel

The Preset Buttons

The five preset buttons allow display configurations to be quickly recalled. The available arrangements are discussed in the Display Layouts section.

The Full Screen Button

The FULL SCREEN button puts the DX-16 into full screen mode. The input to be shown full size is selected via the Menu Up and Down buttons and LCD panel.

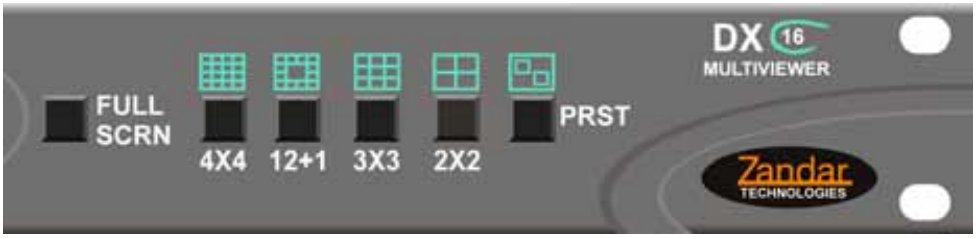

Figure 8: DX-16 MultiViewer control buttons

Note: The freeze function is only available from serial control.

Configuration Buttons

The LCD panel shows the currently active menu item and the arrow keys that are active for the selected menu item.

Figure 9: DX-16 MultiViewer control buttons

The 6 configuration buttons are used to call up LCD menus and have the following functions:

Button	Descriptions
Menu	Use this button to return to the top level menu
Up/Down arrows	Use these buttons to cycle through available menu options
OK	Use this button to select the highlighted menu item as the property for change or to select another sub menu
Left/Right Arrows	Use to cycle through options available for a specified property
OK	Press OK again to apply the change to the selected property

Table 10: Front panel configuration button functions

Display Layout Selection

The DX-16 allows up to 16 input channels to be displayed as video tiles or PiPs (Picture in Picture displays). A variety of factory fitted default layout/files are provided which together allow 8 possible layout variations. In addition any PiP within a currently displayed layout can be instantly re-sized to full screen with the FULL SCRN button.

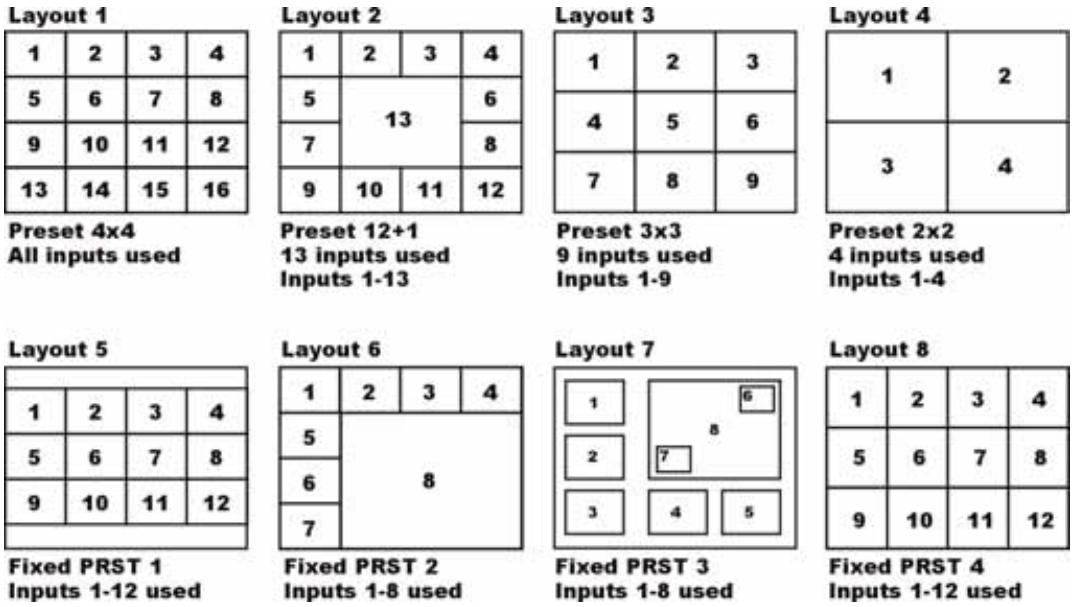

Figure 10: The 8 layout variations

The upper row of four preset layouts have dedicated front control buttons, whilst the lower row of designs are obtained by repeated pressing of the PRST button.

Notes: Fixed PRST 4 is intended for use with Wide Screen images.

Alternative layout/files can be created and 'saved' to the layout buttons using the optional Layout Editor, Z_Editor.

The entire layout range is only available if four DMV4 input cards are fitted

The Preset Layout Buttons

Button	Display	Toggle action
4x4	16 tiles using all 16 Inputs	No
12+1	13 picture tiles (1 – 13)	No
3x3	9 picture tiles (1 – 9)	No
2x2	4 picture tiles (1 – 4)	No
PRST	4 factory/user layouts	PRST1 ⇐ PRST2 ⇐ PRST3 ⇐ PRST4 ⇐ PRST1….
FULL SCRN	Selects Full Screen mode.	No LCD panel shows current full screen input. Select new input with U&D buttons and press OK.

Table 11: Front panel preset button functions

Managing the display

Each PiP or video tile has a number of attributes, which may be modified using the configuration buttons, or by remote control. The main controllable attributes include:

- Border On/Off – acts on all PiPs
- Border color – selected for all PiPs from 9 colors
- GPI – color change of border, border and/or label text background, PiP size change to full screen and/or red Tally Lamp may be lit when PiP GPI active
- Serial Tally – up to three Tally Lamps per PiP with programmable colors
- Audio monitoring data – bargraphs and audio alarms may be displayed on a per PiP basis (requires Option-ZAM and/or Option-EA)
- Caption On/Off – one caption for final output display
- Caption text – 16 character name
- Caption text / background color – select from 9 colors
- Caption position – anywhere inside the output display area
- PiP label text On/Off – turn on or off for each PiP
- PiP label text / background color – select from 9 colors for each PiP
- PiP label text – 16 unique characters for each PiP
- PiP label position – position anywhere in PiP
- Additional PiP text (2nd UMD) configurable from remote interface only
- Clock On/Off – turn the final display clock on or off
- Clock, time, date and position – may be placed, anywhere inside the output display area

Notes: PiP label text may be shown against a 'half tone' video background if desired.

The clock is always shown against a 'half-tone' video background.

The Bargraph scale is always shown in 'half-tone', but the audio level bar and peak bar are shown as solid colors on the bargraph scale.

The active areas for each attribute in a PiP are illustrated in the following diagram:

Figure 11 Typical PiP attributes for Bargraphs, Border, Clock, PiP label and Caption

Remote serial tally commands have been used to provide PiP 3 with a green Tally Lamp and PiP 6 with a red Border Tally.

Label text and bargraphs have been turned off for PiP 6.

Notes: PiP Label text (Channel No.) can be placed anywhere within the PiP.

Overall caption text (Zandar DX-16) can be placed anywhere inside the final display area.

Date and/or time text may be placed anywhere inside the final display area.

Bargraphs and Lamp Tally may be placed anywhere in the PiP.

Audio alarm data may be placed at the top, center or bottom of the PiP.

The DX menu commands

This chapter discusses the local DX-16 MultiViewer commands.

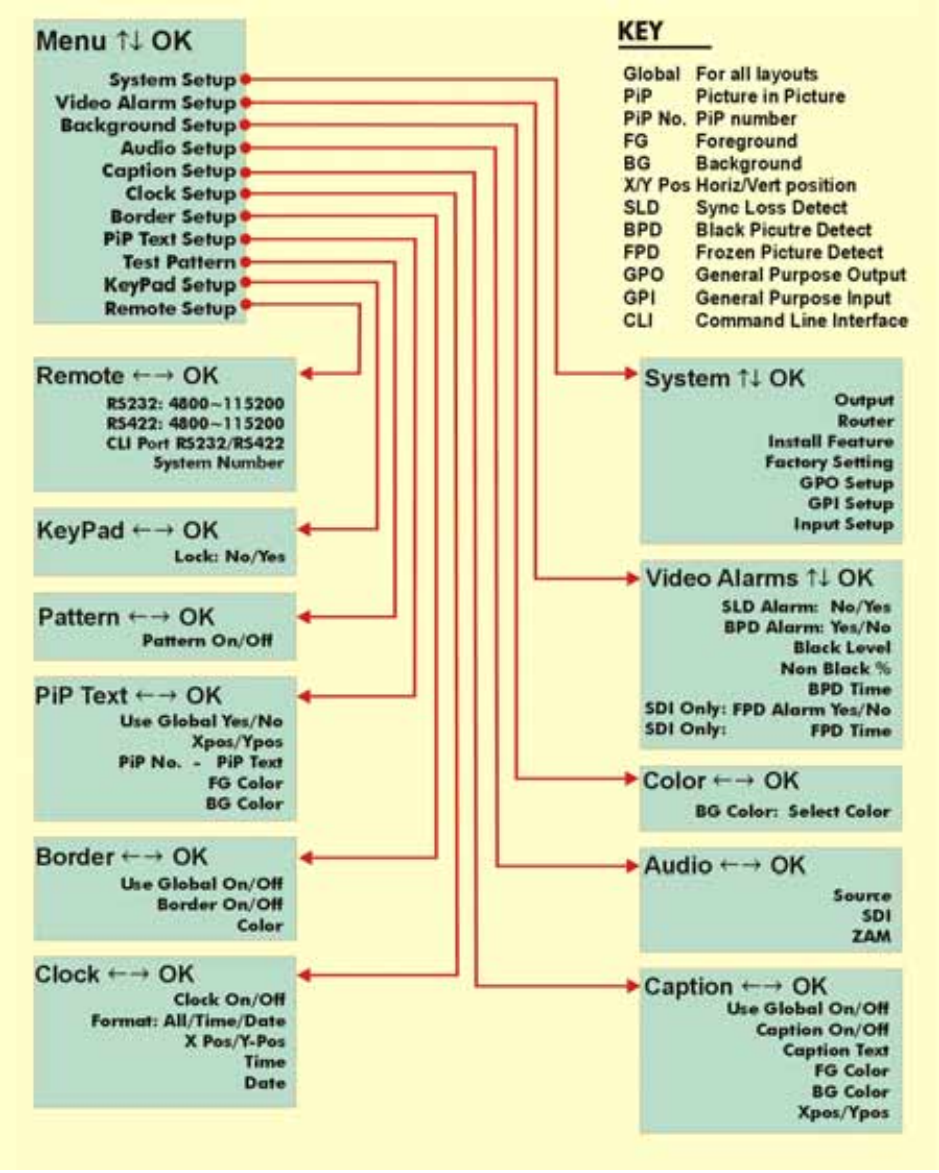

Figure 12: The DX-16 top level menu tree

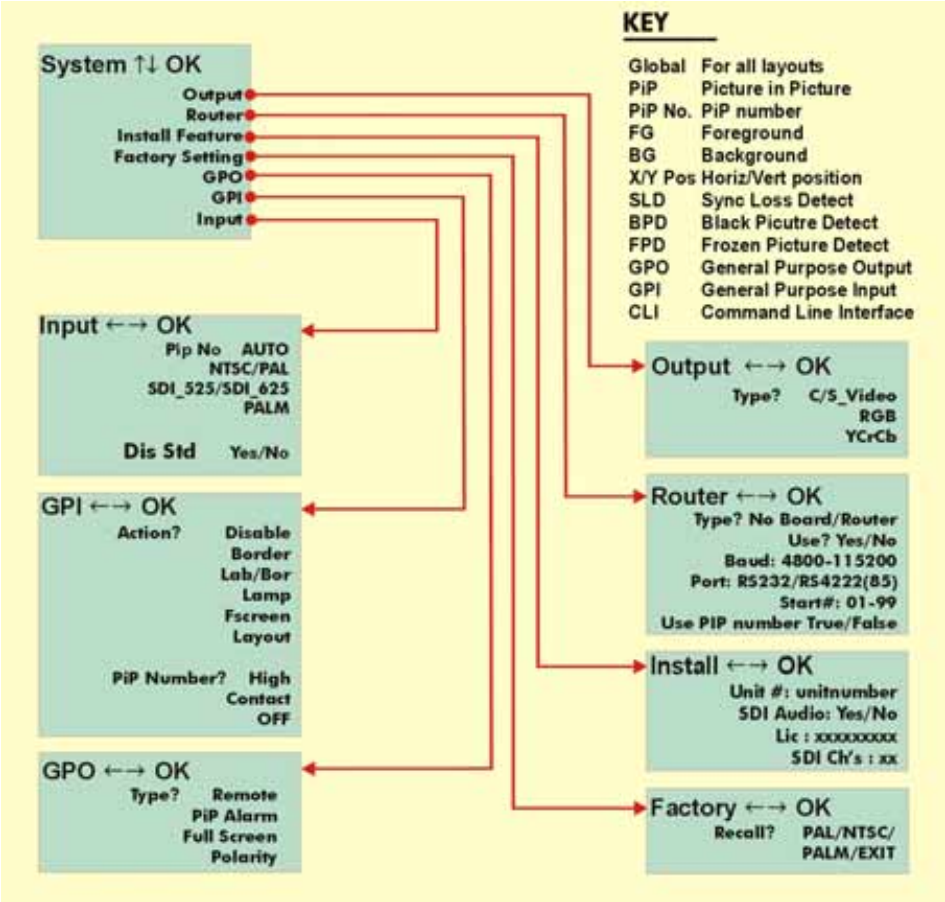

Figure 12A: The DX-16 System sub-menu tree

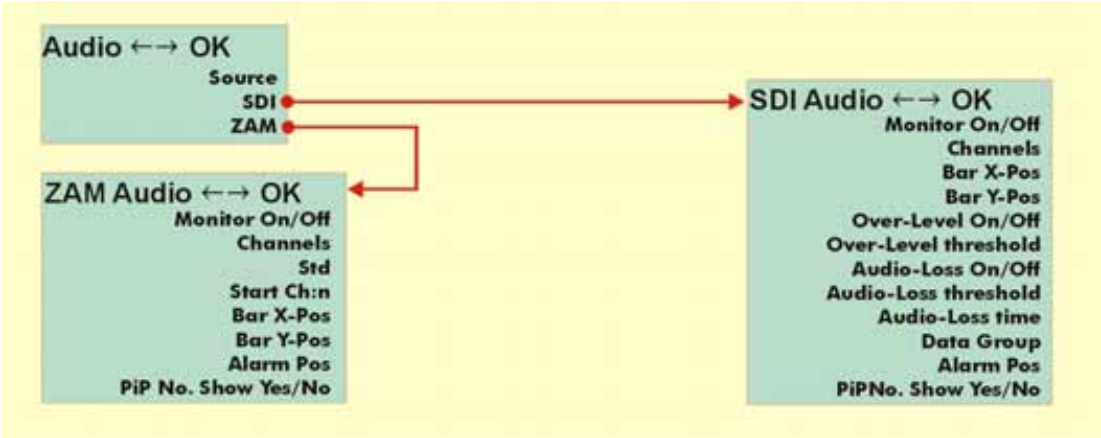

Figure12B: The DX-16 Audio sub-menu tree

Top Level Menu

To return to this menu level, press the Menu button.

DX Menu	Description	Active Buttons
System Setup	Modifies system wide properties e.g. Output format	Use the Up and Down buttons to scroll between menu items and press OK to select a menu item
Video Alarms	Set video alarm settings	
Background Setup	Select background color from color palette	
Audio Setup	Configure on-screen audio bargraphs and audio alarms	
Caption Setup	Changes the caption text on the output display	
Clock Setup	Changes properties of the real time clock and its display	
Border Setup	Change PiP border properties	
PiP Text Setup	Change PiP label properties	
Test Pattern Setup	Enable or disable output display of test pattern	
Keypad Setup	Lock or unlock the User interface buttons	
Remote Setup	Configures communications ports for remote control	

Table 12: Main Menu

Note: Always use the OK button to cycle through multiple menu items.

System Setup

Allows system properties to be changed.

System	Description	Active Buttons
Output Setup	Changes Output properties e.g. YUV/RGB	*U&D to scroll between menu items and OK to enter menu*
Router Setup	Configures optional router setup	
Install Feature	License code protected feature install facility	
Factory Setting	Enable/Disable recall of factory defaults on next power up	
GPO Setup	Configures functionality of General purpose output lines	
GPI Setup	Configures functionality of General purpose input lines	
Input Setup	Configures input standard selection and display	

Table 13: System Setup Menu

System Setup - Output Setup

Allows output display properties to be changed.

Output	Description	Active Buttons
Type?	RGB / YCrCb (YUV) / C/S_Video (Composite & S-Video)	R&L to choose OK to apply

Table 14: Output Properties Menu

System Setup – Router Setup

Configures router interface.

Router	Available option	Active Buttons
Type?	No Board/Router Select name of attached router	R&L to choose OK to apply and select next menu
Use?	Yes/No – 'Yes' enables PiP label data from router – 'No' selects DX labels for all PiPs	R&L to choose OK to apply and select next PiP/Dis Std menu
Baud	Select Baud rate to match router: 4800/9600/19200/38400/57600/115200	R&L to choose OK to apply
Port	Select to match router: RS232/RS422(485)	R&L to choose OK to apply
Start #	Set the DX router card start address: 01 – 99	U&D to choose and select next menu OK to apply
Use PiP x	True / False - 'True' enables DX to display router data for selected PiP - 'False' forces DX to display DX label for selected PiP	R&L to choose and select next PiP or end OK to apply

Table 15: Router Setup Menu

Note: Routers currently supported are TSL, Probel and Thomson.

For more information see the Router Installation and Configuration in Appendix 1.

'No Board' will be displayed if the Router is not preset and 'No Data x' will be displayed if no data or invalid data is received – where x is PiP number.

System Setup – Install Feature

Allows features to be added by entering a license code.

Install Feature	Available option	Active Buttons
Unit #	XXXXXXXX – 8 digit non-editable number generated by DX – needed to obtain license code	OK to select next menu
SDI Audio:	Yes/No	R&L to choose OK to apply and select next menu
Lic #:	XXXXXXXX – Enter 8 digit license code.	R&L to choose character OK to apply and select next menu
SDI Ch's: nn	The number 'nn' of channels enabled will correspond to the number purchased.	OK to leave menu

Table 16: Install Feature Menu

Note: License code will be preinstalled on DX's ordered with SDI embedded audio monitoring. For field upgrade of DX contact Zandar Technologies or local representative for the license code to enable this feature.

System Setup – Factory Settings

Allows standard specific factory defaults to be recalled.

Factory Settings	Description	Active Buttons
Recall?	PAL, NTSC, PAL-M or EXIT (exit without Factory Reset)	R&L to choose OK to apply

Table 17: Factory Settings

Note: Changing factory settings always requires a Factory Reset. (Power down and up again). Controls are disabled until the Factory Reset is applied. Use EXIT to avoid disabling controls if Factory Reset is not required.

The default factory setting is NTSC, which is used in North America and Japan. PAL is common in most of Europe and Asia and PALM is used in Brazil.

System Setup – GPO Setup

Allows output properties to be assigned for each GPO line. The GPO lines are active low.

GPO	Available option	Active Buttons
Type?	Remote/PiP_Alarm/FScreen	R&L to choose OK to apply and go to select polarity menu
Polarity	N_Open/N_CLosed. Select GPO polarity; Normally Open or Normally Closed (Default)	R&L to choose OK to apply and exit menu

Table 18: GPO Properties Menu

Notes: Remote: Allows the GPO lines to be driven from the Command Line Interface port (see GPO_SET on page 63)

PiP_Alarm: Audio or video PiP alarm activates appropriate GPO line

FScreen: PiP full screen activates appropriate GPO line. Size may be scaled or cropped in PAL/625 out – see trouble shooting section for further details

System Setup - GPI Setup

Each GPI line is mapped to different PiP and the action taken when a GPI line is active can be assigned for each.

First select the action to be performed when a GPI line is driven active, then select the input type for each GPI.

GPI	Available option	Active Buttons
Action?	Disable – no action Border – Border changes red only Lab/Bor – Label and Border change red Lamp – Onscreen Tally Lamp appears FScreen – PiP Full screen Layout – Recall layout	R&L to choose available option OK to apply and select GPI Type for each PiP
PiP n, GPI type	Where 'n' is PiP number and GPI type is Active High, Contact Closure or Off The GPI Type menu appears after all GPI actions have been selected for each PiP	R&L to choose GPI input type OK to apply and select next PiP

Table 19: GPI Properties Menu

Note: The standard CLI tally command allows for RED and GREEN tallies. The SET_MUL_TALLY command allows for Red, Green and Yellow.

When GPI is in Layout mode GPIs 0 - 7 will recall layouts 1 - 8.

System Setup - Input Setup

Allows input standard to be assigned for each input and optionally displayed.

Input	Available option	Active Buttons
PIP n: std	Where 'n' is PiP number and 'std' is one of: AUTO (default), NTSC, PAL, SDI_525, SDI_625, PAL-M (Std can also be chosen during factory reset – see Factory Settings)	R&L to choose available option OK to apply and select next PiP/Dis Std menu
Dis Std	YES/NO – momentary display of input standard in center of PiP when standard changes in AUTO mode The Display menu appears after the input standard has been selected for all PiPs	R&L to choose OK to apply

Table 20: Input Standard Menu

Note: Auto allows a new input to be locked and displayed within 5 seconds of any line standard or SDI/analogue format change. No system reset is necessary.

For best results, it is recommended to select an output line standard that reflects the line standard of the majority of inputs.

Video Alarm Setup

The Video Alarms Setup menu provides access to the Black Picture and Frozen Picture detection settings.

Video Alms	Video Alarm options	Active Buttons
SLD Alarm	Yes/No. Enable or disable Sync Loss Detection	*R&L to choose* *OK to apply/next menu*
BPD Alarm	Yes/No. Enable or disable Black Picture Detection	*R&L to choose* *OK to apply/next menu*
Black Level	Set black level threshold level between 0 and 99. (Default is 25)	*U&D to change digit* *R&L to select digit for change.* *OK to apply/next menu*
Non Black %	Select non-black pixels from 0 to 9%. Default is 1%	*R&L to choose text color* *OK to apply/next menu*
BPD Time	Select time for BPD detect between 0 and 9 seconds (Default is 3 seconds) After this time the on-screen alarm 'BP' will be shown	*U&D to choose* *OK to apply/next menu*
FPD Alarm (SDI only)	Yes/No. Enable or disable SDI Frozen Picture Detection	*R&L to choose* *OK to apply/next menu*
FPD Time (SDI only)	Select time for SDI FPD detect between 0 and 9 seconds. (Default is 3 seconds) After this time the on-screen alarm 'FP' will be shown	*U&D to choose* *OK to apply/leave menu*

Table 21: Video Alarm Setup Menu

Sync Loss Detection

On detection of loss of analog sync or SAV/EAV SDI sync on a PiP input, the appropriate GPO line is driven active.

Black Picture Detection

The number of consecutive frames where each frame is considered to be black is counted. If the number of Black Frames exceeds the BPD Time limit in seconds an alarm (BP) is shown on-screen.

The Black Level threshold above which black is detected is adjustable from 0 to 99 and the default is 25. Set the percentage of Non-Black Pixels to mask logos or other graphic elements that may be added to the video chain. This allows a video feed whose program video has failed at black but still carries a logo, to still be detected by the BPD alarm.

Frozen Picture Detection (SDI only)

The number of consecutive frames that have the same checksum is counted. If that number exceeds the FPD Time limit in seconds an alarm (FP) is shown on-screen.

Background Setup

Allows screen background color to be selected.

Background	**Available option**	**Active Buttons**
BG Color	Black/Gray/Yellow/Cyan/Green/Magenta/Red/ Blue/Orange	*R&L to select color* *OK to apply/next menu*

Table 22: Background Setup Menu

Audio Setup

Select bargraph source when both ZAM/SDI options fitted.

Audio	**Available option**	**Active Buttons**
Source	Select embedded(SDI) or external (ZAM) source for audio bargraphs SDI – refer to SDI audio menu ZAM – refer to ZAM audio menu	*R&L to choose* *OK to apply/next menu*

Table 23: Embedded Audio Setup Menu

Note: If only one option fitted ZAM or SDI menu is entered directly.

SDI audio menu

The following options are only presented if SDI is selected as a source.

SDI audio	Available de-embedded audio options	Active Buttons
Monitor	Turns all audio bargraphs and alarms On or Off	*R&L to choose OK to apply/next menu*
Channels	Select Two or Four audio channels	*R&L to choose OK to apply/next menu*
Bar X_Pos	Bargraph position 0 – 99 (relative to left hand side of PiP in 2-channel mode and relative to right hand side for third and fourth channels in 4-channel mode).	*U&D to change digit R&L to select digit for change. OK to apply/next menu*
Bar Y_Pos	Bargraph position 0 - 99 relative to top of PiP	*U&D to change digit R&L to select digit for change. OK to apply/next menu*
Over-level	On/Off	*R&L to choose OK to apply/next menu*
Over-level threshold	Select over-level threshold in dB (0 to 99)	*R&L to choose OK to apply/next menu*
Audio-loss	On/Off	*R&L to choose OK to apply/next menu*
Audio-loss threshold	Select audio-loss threshold in dB (0 to 99)	*R&L to choose OK to apply/next menu*
Audio-loss time	Select audio-loss time in seconds	*R&L to choose OK to apply/next menu*
Data Group	Select 1 – 4 only. Selects which group of 4 audio channels are monitored within the SDI stream (total 16 audio channels, 4 groups)	*R&L to choose OK to apply/next menu*
Alarm Pos	Top/Bottom/Center Position of the Audio Alarms within the PiP	*R&L to choose OK to apply/next menu*
PiP No Show	Yes/No Set to Yes to display audio data on a per PiP basis.	*U&D to change digit R&L to select digit for change. OK to apply/next menu*

Table 24: Embedded Audio Setup Menu

ZAM audio menu

The following options are presented if ZAM is selected as a source or if the SDI embedded audio upgrade is not installed.

ZAM audio	Available ZAM audio options	Active Buttons
Monitor	Turns all audio bargraphs and alarms On or Off	*R&L to choose* *OK to apply/next menu*
Channels	Select Two or Four audio channels	*R&L to choose* *OK to apply/next menu*
Std	Select bargaph scale, AES/EBU, Nordic, DIN_ppm, BBD_ppm, VU, VU_ext	*R&L to choose text color* *OK to apply/next menu*
Start CH: n	Select channel to start display from – used when multiple DX frames connected to one ZAM frame. See page 45.	*R&L to choose* *OK to apply/next menu*
Bar X_Pos	Bargraph position 1 – 99 (relative to left hand side of PiP in 2-channel mode and relative to right hand side for third and fourth channels in 4-channel mode).	*U&D to change digit* *R&L to select digit for change. OK to apply/next menu*
Bar Y_Pos	Bargraph position 1 - 99 relative to top of PiP	*U&D to change digit* *R&L to select digit for change. OK to apply/next menu*
Alarm Pos	Top/Bottom/Center Position of the Audio Alarms within the PiP	*R&L to choose* *OK to apply/next menu*
PiP No Show	Yes/No Set to Yes to display audio data on a per PiP basis.	*U&D to change digit* *R&L to select digit for change. OK to apply/next menu*

Table 25: External 'ZAM' Audio Setup Menu

Note: Set Monitor to Off if no ZAM is connected.

The scale selected in the DX MUST be the same scale selected in the ZAM for correct audio level display.

The ZAM bargraph must also be selected as HALF size.

It is not possible to display external and embedded audio bargraphs at the same time.

Caption Setup

Allows Caption Text properties to be configured.

Caption	Available option	Active Buttons
Use Global	YES/NO. Use Global (YES) or layout/file (NO) settings with each layout/file	*R&L to choose* *OK to apply/next menu*
ON/OFF	Turns caption display on or off	*R&L to choose* *OK to apply/next menu*
Text	The Caption's text 16 alphanumeric characters and symbols +, #, =, - . / Use '_' (underscore character) for space character	*U&D to change character* *R&L to select character for change* *OK to apply/next menu*
FG Color	Color of the Label	*R&L to choose text color* *OK to apply/next menu*
BG Color	Color of the background of the label	*R&L to choose* *OK to apply/next menu*
X_Pos	Caption position, relative to left hand side of screen (default 594)	*U&D to change digit* *R&L to select digit for change. OK to apply/next menu*
Y_Pos	Caption position, relative to top of screen (default 550 PAL, 455 NTSC)	*U&D to change digit* *R&L to select digit for change. OK to apply/next menu*

Table 26: Caption Text Setup Menu

Note: Global settings (YES) apply to all the layout/files stored in the DX. For specific changes to properties such as labels, the border or caption within a particular layout, use the Z_Editor Layout Editor and select (NO) for Layout/File settings.

Clock Setup

Allows On-Screen properties of the DX real time clock to be configured.

Clock	Available option	Active Buttons
Clock	Turn the display clock ON or OFF	*R&L to choose* *OK to apply/next menu*
Format	Show Time only Show Date only Show All	*R&L to select format* *OK to apply/next menu*
X_Pos	Clock horizontal position, relative to left hand side of screen (default 20)	*U&D to change digit* *R&L to select digit for change. OK to apply/next menu*
Y_Pos	Clock horizontal position, relative to top of screen (default 550 PAL, 455 NTSC)	*U&D to change digit* *R&L to select digit for change. OK to apply/next menu*
Time	Change Time	*U&D to change character* *R&L to select next caption character for change* *OK to apply/next menu*
Date	Change Date	*U&D to change character* *R&L to select next caption character for change* *OK to apply/next menu*

Table 27: Clock Setup Menu

Notes: Date is set to US format (mm/dd/yy) for NTSC & PAL-M factory defaults and European format (dd/mm/yy) for PAL factory defaults.

Border Setup

Allows Border state and color to be selected for all PiPs.

Border	**Available option**	**Active Buttons**
Use Global	YES/NO. Use Global (YES) or Layout/file (NO) settings with each layout/file	*R&L to choose* *OK to apply/next menu*
On/Off	Turn all Borders ON or OFF	*R&L to select state* *OK to apply/next menu*
Color	Select the Border color for all PiPs	*R&L to select color* *OK to apply/next menu*

Table 28: Border Setup Menu

PiP Text Setup

Allows PiP text properties to be configured. First select the PiP number for modification, then change text properties.

PiP Text	**Available option**	**Active Buttons**
Use Global	YES/NO. Use Global (YES) or Layout/file (NO) settings with each layout/file	*R&L to choose* *OK to apply/next menu*
X_Pos	Label horizontal position, relative left hand side of screen	*U&D to change digit* *R&L to select digit for change. OK to apply/next menu*
Y_Pos	Label vertical position, relative to top of screen	*U&D to change digit* *R&L to select digit for change. OK to apply/next menu*
PiP Number	Choose the PiP number for modification	*U&D to choose* *OK to apply/next menu*
PiP Text	Change PiP text 16 alphanumeric characters and symbols +, #, =, - . / Use '_' (underscore character) for space character.	*U&D to change character* *R&L to select next caption character for change* *OK to apply/next menu*
FG Color	Label color	*R&L to choose text color* *OK to apply/next menu*
BG Color	Label background color	*R&L to choose color* *OK to apply/next menu*

Table 29: PiP Text Setup Menu

Note: Global settings (YES) apply to all the layout/files stored in the DX. For specific changes to properties such as labels, the border, caption or clock within a particular layout, use the Z_Editor Layout Editor and select (NO) for Layout/File settings.

Test Pattern Output

Allows a Color Bar test signal to be displayed.

Test Pattern	Description	Active Buttons
Pattern	ON/OFF	R&L to choose OK to apply/next menu

Table 30: Test Pattern ON/OFF Menu

Keypad Setup

Allows the Keypad to be locked so that changes cannot be made to the display.

Keypad	Description	Active Buttons
LOCK	Yes/No	R&L to choose OK to apply/next menu

Table31: Keypad LOCK/UNLOCK Menu

Remote Control Setup

Allows the Baud rate for each remote port to be selected.

Remote	Available options	Active Buttons
RS232 Baud rate	4,800 / 9,600 / 19,200 / 38400/57,600 / 115,200	*R&L to select Baud rate* *OK to apply*
RS422 Baud rate	4,800 / 9,600 / 19,200 /38400/ 57,600/ 115,200	*R&L to select Baud rate* *OK to apply*
CLI Port	RS232, RS422 – Command Line Interface port	*R&L to select CLI port* *OK to apply/next menu*
System #: xx	Assign system number from 00 to 99	*R&L to select number* *OK to apply/next menu*

Table 32: Remote Control Setup Menu

Note: The port, which is not selected for the Command Line Interface, will be used for the ZAM data port. Check that the ZAM is factory configured for that port type.

Colors

This sub-menu is used by the Text, Caption, Clock and Border menus to allow color to be selected for the chosen property.

Menu Item	Notes	Active Buttons
Gray		*R&L to choose* *OK to apply* *For all colors*
Yellow		
Cyan		
Green		
Magenta		
Red		
Blue		
Orange		
Black		
Half Tone	Choice for PiP labels (Video underneath label is at half intensity)	

Table 33: Color Sub-Menu

Note: See also table 40, which shows the DX color palette accessible from the Command Line Interface together with hex representations of each color.

Factory Settings

The factory default settings are shown in the following tables:

DX Parameter	Default Setting
Output Setup	Comp_S_Video
Input Setup	AUTO
Show Auto Input Standard	YES
Use Global Caption Settings	YES
Use Global PiP Text Settings	YES
Use Global Border Settings	YES
Screen Background Color	Black
Screen Caption Text	"Zandar DX"
Screen Caption	ON
Screen Caption FG Color	White
Screen Caption BG Color	Blue
Screen Caption text X Position	594
Screen Caption text Y Position	550 PAL, 455 NTSC
Screen Setup	DX16: 4x4 Display DX4: 2x2 Display
Clock On	ON
Clock Style	TIME
Clock X Position	20
Clock Y Position	550 PAL, 455 NTSC
PIP Border Color	GRAY
PIP Border On	ON
PIP Text FG Color	GRAY
PIP Text BG Color	TONE
PIP Text X Position	005
PIP Text Y Position	005
PIP Text	DX16: PIP # (1-16) DX4: PIP # (1-4)
Font size	Standard
Test Pattern	OFF
Key Pad Lock	NO

Table 34: Factory Defaults

DX Parameter	Default Setting
Command Line Interface	RS232
RS232 Baud	57600
RS422 Baud	57600
Use Router	No
Router Baud	BAUD_57600
Router Port	RS232_PORT
Router Start Address	1
GPO Setup	Remote
GPI PIP Setup	Disabled
GPI Action	GPI_Active_High
Audio Source	AUDIO ZAM SOURCE
Embedded Monitor Over Level	No
Embedded Over Level Threshold	8
Embedded Monitor Audio Loss	No
Embedded Audio Loss Threshold	40
Embedded Monitor Audio Loss Time	30
Embedded Audio Group	1
Monitor (ZAM audio bargraphs/alarms)	On
Channels (ZAM/SDI)	Two
Std (ZAM)	Nordic
Start Ch (ZAM)	01
Multiple Tally X-Position	Tally 1: 5, Tally 2: 10, Tally 3: 15
Multiple Tally Y-Position	All Tally: 5
Multiple Tally Width	All Tally: 5
Multiple Tally Height	All Tally: 5
Tally Type	TALLY_LIGHT
Multiple Tally colors	Tally 1 Red, Tally 2 green and Tally 3 yellow
Bar X-Position	20
Bar Y-Position	01
PiP No. Show	DX16: Yes (1-16) DX4: Yes (1-4)
Alarm Position	Center

Table 35: Factory Defaults continued

DX Parameter	Default Setting
PiP_TXT2 FG color	White
PiP_TXT2 BG color	Half Tone
PiP_TXT2 X-Pos	5
PiP_TXT2 Y-Pos	20
Enable SLD Alarm	No
Enable BPD Alarm	No
Black Level threshold	25
Non black pixels	1%
BPD Time	3 seconds
Enable SDI FPD Alarm	No
SDI FPD Time	3 seconds

Table 36: Factory Defaults continued

Audio Monitoring

The DX-16 may be configured to provide support for real-time audio level meters and audio alarms for either de-embedded audio from the SDI inputs or from external audio. Two or four audio bars can be displayed in each PiP to monitor up to a maximum of 32 audio channels. External audio support requires the Zandar ZAM-32/24/16/8 In-Picture Audio Meter.

Figure 13: Typical PiP attributes for Bargraphs and Audio Alarms

The bargraph scale is mixed with the background. The audio bar, peak level bar and the normal operating level marking of the scale replace the background. This improves the visibility of the bargraphs whilst keeping their appearance as discreet as possible.

Notes: Not all scale numbering will be visible against near-white backgrounds. Bargraphs are automatically resized with each PiP.

Scales & ballistics

The ZAM-32 supports the following audio scales:

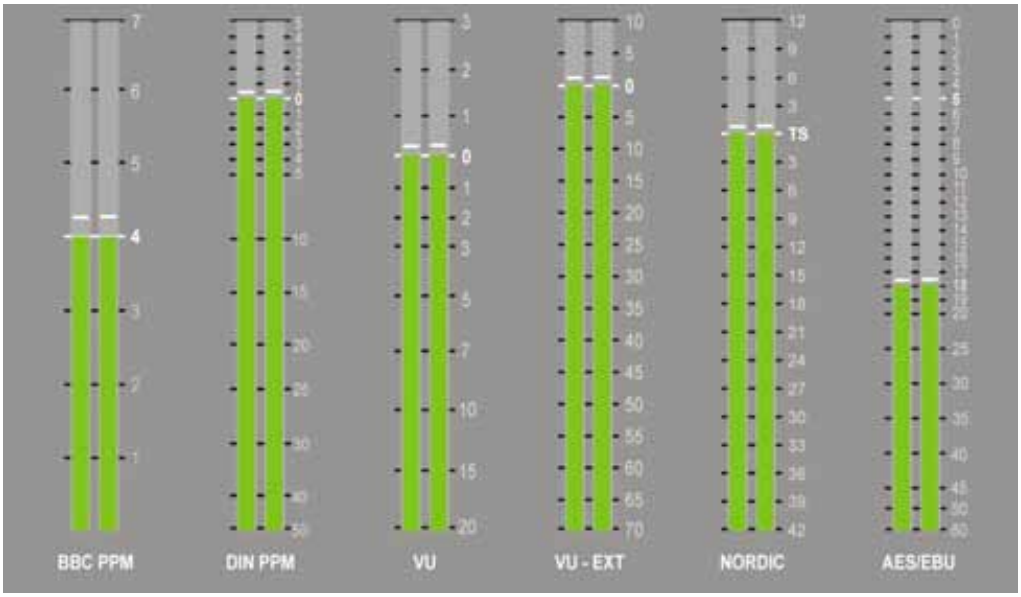

Figure 14: Available audio bargraphs

If 'ZAM' has been chosen as an audio source , the half-tone bargraphs scale graphics are supplied directly by the DX-16 and the audio bars themselves will not appear unless a properly configured ZAM In-Picture Audio Meter has been connected to the DX-16. Refer to the ZAM manual for details of ZAM installation and operation.

If SDI has been selected as the audio source, only AES/EBU bargraphs will be available

Scale	Dynamic range		Attack time	Decay time
BBC_PPM	24dB	+12dB to –12dB	10mSec	2.8 seconds per 24dB decay
DIN_PPM	55dB	+5dB to –50dB	10mSec	1.5 seconds per 20dB decay
VU	23dB	+3dB to –20dB	400mSec	500 milliseconds per 20dB decay
VU-EXT	80dB	+10dB to-70dB	400mSec	500 milliseconds per 20dB decay
NORDIC	54dB	+12dB to –42dB	10mSec	1.7 seconds per 20dB decay
AES/EBU	60dB	0 to –60dB	One sample	1.5 seconds per 20dB decay

Table 37: Scale dynamic range and ballistics

Note: A white graticule bar denotes typical line-up operating level. Actual operating levels may be different.

Audio alarm symbols

The following codes are used to indicate SDI/ZAM alarms for up to four channels per PiP. No Audio Alarms are shown at all if all audio channels are without error (OK).

Alarm parameter	'ZAM' Symbols	'SDI' Symbols
No Carrier Detect	C	Not available
Audio Loss	A	A
Over Level	O	O
Anti-phase alarm	P	Not available
No data from ZAM	Z	Not applicable
Channel OK	-	-

Table 38: Audio alarms

The Audio Alarm indicators can be placed at the top, middle or bottom of the PiPs.

Note: ZAM alarm configuration is done only in the ZAM. Refer to the ZAM User Manual for further information.

Meter color-coded transitions

The transition point at which the color of the audio level bar changes from green to red is fixed for each meter scale. The Overload transition point beyond which the Overload symbol 'O' appears is also meter scale-dependent, but the bar itself does not change color.

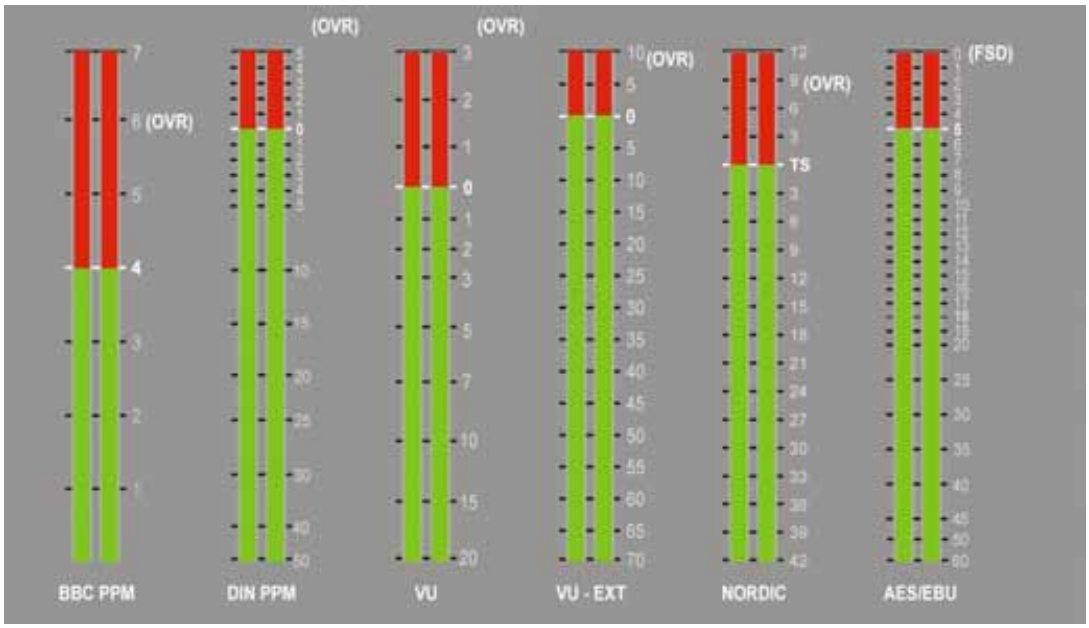

Figure 15: DX meter fixed scale colors

The Overload point at which the 'O' symbol appears on screen is shown in the above diagram by OVR for analog meters and FSD for the AES/EBU digital meter.

For most analog scales the Overload point is 8dBu above the test or line-up level of 0dBu or 0.775V RMS. The OVR codes are not shown in the on-screen display.

The VU meter scales are calibrated such that 0VU is 0dBu.

Connecting a ZAM

The Zandar ZAM In-Picture Audio Meter may be connected to the DX-16 providing the DX-16 firmware is version 3.0 or higher. The ZAM is available with either an RS422 interface or RS232 interface if an internal RS422 to RS232 converter has been fitted at the factory.

Port 1 on the ZAM will have either a RS232 or RS422 label to indicate which serial interface is used to connect to the DX-16.

The ZAM will use the port (RS232 or RS422) which is not selected for the Command Line Interface as the ZAM data port.

ZAM set for RS232 on port 1

If port 1 on the ZAM is internally configured for RS232, set the Command Line Interface on the DX-16 for RS422. Then use the supplied RS232 serial cable to connect from the DX-16 RS232 port to port 1 on the ZAM.

ZAM set for RS422 on port 1

If port 1 of the ZAM is internally configured for RS422, set the Command Line Interface on the DX-16 for RS232. Then use the supplied RS422 serial cable to connect from the DX-16 RS422 port to port 1 on the ZAM.

In either case ensure that port 1 on the ZAM is set to PC/AM32 via the ZAM OSD.

Refer to the Remote Control Setup menu on page 35 for other options.

Refer to the ZAM/DX Quick Start Chapter to set up both the DX-16 and ZAM to provide on-screen audio support. Further details of the ZAM installation and operation will be found in the ZAM user guide.

Using multiple DX units

A single ZAM may be connected to multiple DX units as indicated in the following illustration:

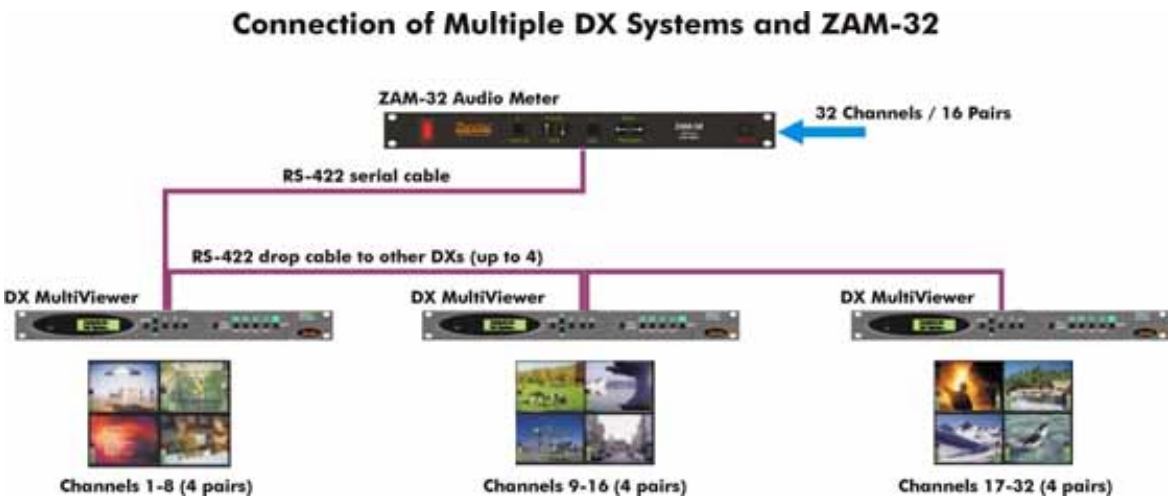

Figure 16: Connecting multiple DX units to a single ZAM-32

A single ZAM can be connected to multiple DX units if port 1 is set to RS422. Connect the supplied serial cable to the first DX unit, then loop to the remaining DX units up to a maximum of 4 DX's. Refer to the ZAM manual for cable pinout.

The Audio Setup menu on page 25 provides a channel start command to allow each DX in the above configuration to commence its display of audio bargraphs and alarms from a specific audio channel from the ZAM. This is the Start CH:n command where n is the audio channel pair from which the audio data is displayed.

For example in the above example, the first DX will be set for Start CH: 01, the second DX will be set to Start CH: 09 and the last DX will be set to Start CH: 17.

Note: It is possible to split an audio pair between two PiPs, by using even channel numbers.

ZAM/DX Quick Start Guide

The following steps are intended as a rapid installation guide to enable audio support on the DX unit from a ZAM In-Picture Audio Meter.

Audio Wiring

- Connect up the audio input channels as per connector diagrams in the ZAM User Manual

ZAM Setup

- Connect the Video output of the ZAM to Input 1 of the DX unit
- Set the DX unit to Full Screen Input 1
- Reset the ZAM by power cycling it while holding the up and down function keys until the red and green LED's turn off
- Power cycle again
- Press and hold the 'Lock' key on the front of the ZAM to bring up the configuration menus
- Setup the following in the menu using the Up and Down arrows to navigate and the Left and Right arrows to change parameters:

ZAM Parameter	Required Setting
Meter Operating Mode	HALF
Scales Select	Same as Meter Standard (Std) in DX unit
Video Standard Internal	PAL (Default)

- Press and hold the 'Lock' key to return to normal operating mode

The Audio Bars should appear in Input 1.

ZAM to DX Interconnect

Connect the ZAM to the DX using the serial cable supplied.

- Connect from Port 1 on the ZAM to the RS422 port of the DX if the ZAM is RS422
- Connect from Port 1 on the ZAM to the RS232 port of the DX if the ZAM is RS232

DX Setup

- Audio Menu Setup:

DX Audio Menu Setup	Required Setting
Monitor	On
Meter Standard (Std)	Same as Scales Select in ZAM

- Remote Menu Setup:

DX Remote Menu	Required Port Configuration
BAUD rate for ZAM data	115200
CLI (Command Line Interface)	Opposite to ZAM port

DX Port Configuration Examples:

If you have an RS422 ZAM set the CLI to RS232 and set the RS422 baud rate to 115200

If you have an RS232 ZAM set the CLI to RS422 and set the RS232 baud rate to 115200

Note: Refer to the ZAM User Manual for more details and information on alarm setup.

Using the Z_Editor

The Z_Editor is a software tool that allows layout/file configurations to be created/edited for Zandar's range of MultiViewers.

Z_Editor is designed to run on any Personal Computer running a Microsoft Windows operating system. Z_Editor communicates with the DX-16 over an RS232 serial communications port.

Eight presets can be recalled from the front control panel or via a remote system over a serial port. Z_Editor allows these presets to be edited and an unlimited number can be created and saved by Z_Editor itself.

Z_Editor Features

- Read and edit all preset layout/files that are stored on a MultiViewer or create new layouts
- Save layouts to both MultiViewer and PC's Hard Disk
- Offline edit mode
- Define which input PiP channels are visible on the output display
- Define the following properties for each PiP
  - PiP Position
  - PiP Size
  - PiP Cropping
  - PiP Border margins and color
  - PiP Labels (including position and color)
- Resize and position PiPs using standard windows drag and drop
- Resize and position PiPs with pixel accuracy
- Copy the properties of PiP to any other PiP
- Overlap PiPs and assign priority

Installation

To prepare for Z_Editor software installation proceed as follows:

- With your PC and the DX unpowered, connect a spare PC serial port to an RS232 (Com 1) port on the DX using a null-modem cable
- Power the DX and check that the RS232 port is set for 57600 Baud and that the CLI port is set to RS232

Note: A null-modem cable has pins 2 and 3 (Rx/Tx) crossed over.

To install the Z_Editor software proceed as follows:

- Insert the supplied media into the CD drive
- The Install Shield should start - obey the prompts to load the application onto your hard drive
- If necessary change the default target install directory
- Ensure that a serial connection has been established between your PC and a supported MultiViewer
- Ensure that the MultiViewer Baud rate has been set for 57,600 Baud
- Run Z_Editor from the start menu

When Z_Editor is first launched it will try to connect to a MultiViewer on COM port 1 using a Baud rate of 57,600. If Z_Editor successfully connects to the MultiViewer it will upload from the MultiViewer the active file and display it in the Z_Editor window.

If Z_Editor does not find a MultiViewer then it will display an offline mode menu and request the type of MultiViewer required.

Full layout editing capability will be supported in off-line mode, but no layout/files can be uploaded until a connection to a MultiViewer is made.

The application is supported with full on-line help. This chapter is intended to provide installation help and an overview of the main functionality. Full details of the functionality provided is supplied in the on-line help file.

Note: Some of the features shown in the following off-screen pictures are not supported by all MultiViewers. Please refer to the on-line help for more information.

Z_Editor Application

Toolbar or drop down menus provide access to configuration menus that allow pixel accuracy in positioning each PiP on screen.

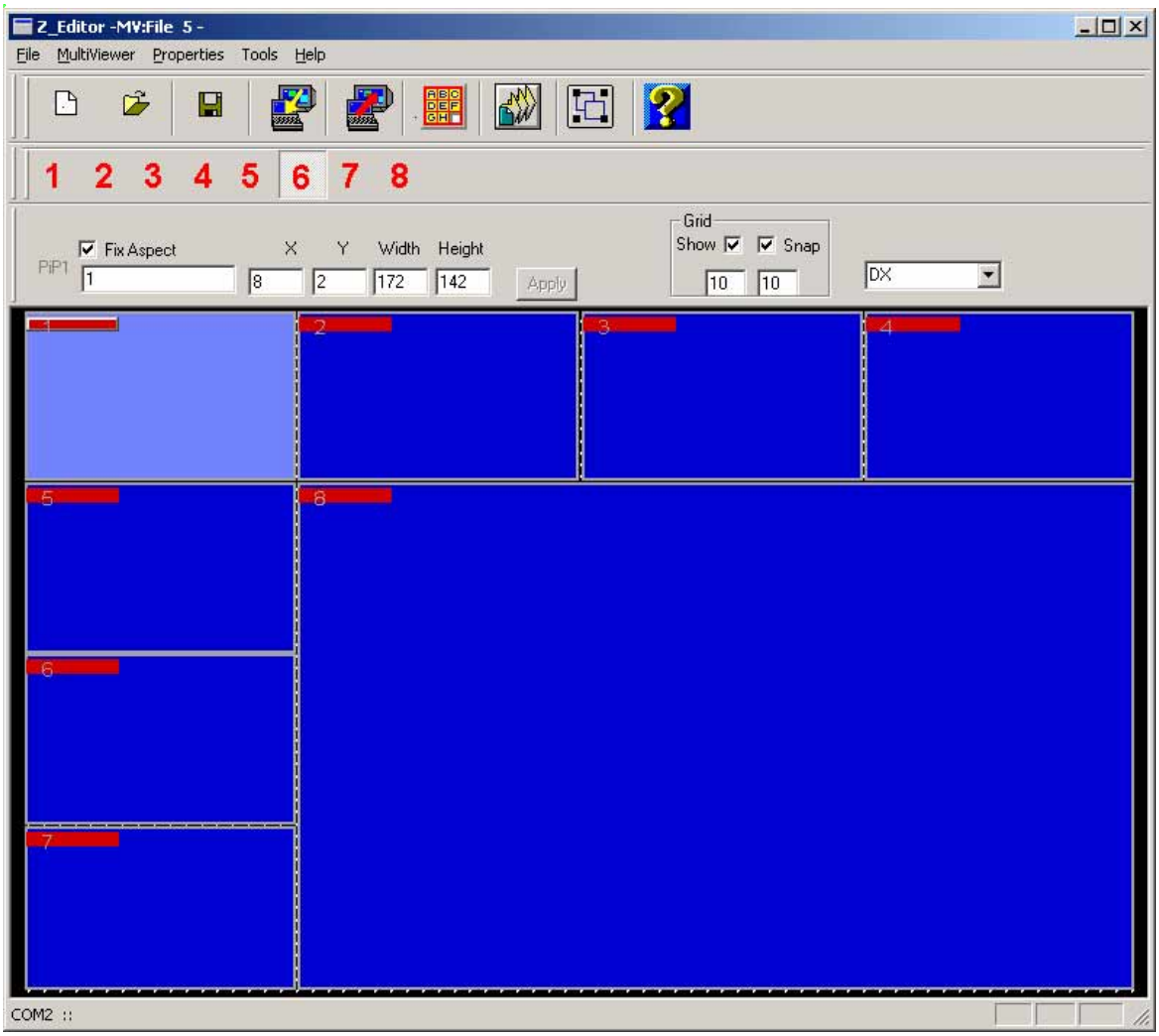

Figure 17: Z_Editor showing modified 4x4 PiP layout

The layout editor also allows each PiP to be positioned or resized interactively using a mouse.

Background color and the total number of PiPs to be supported is set using Systems Properties.

Using Z_Editor menu shortcuts

All of Z_Editor's functions may be accessed from the tool bar menu. For convenience, Z_Editor is equipped with short cut buttons, which are accessed by clicking on the icons on the tool bar.

If a MultiViewer is connected the 10 presets will be 'live' and shown by the red numbers 1 to 10 in the tool bar.

Click on a preset to download the preset layout from the connected MultiViewer. The layout may then be edited, re-named and saved back to the MultiViewer in any preset. Layouts may also be saved or loaded locally on to the PC storage.

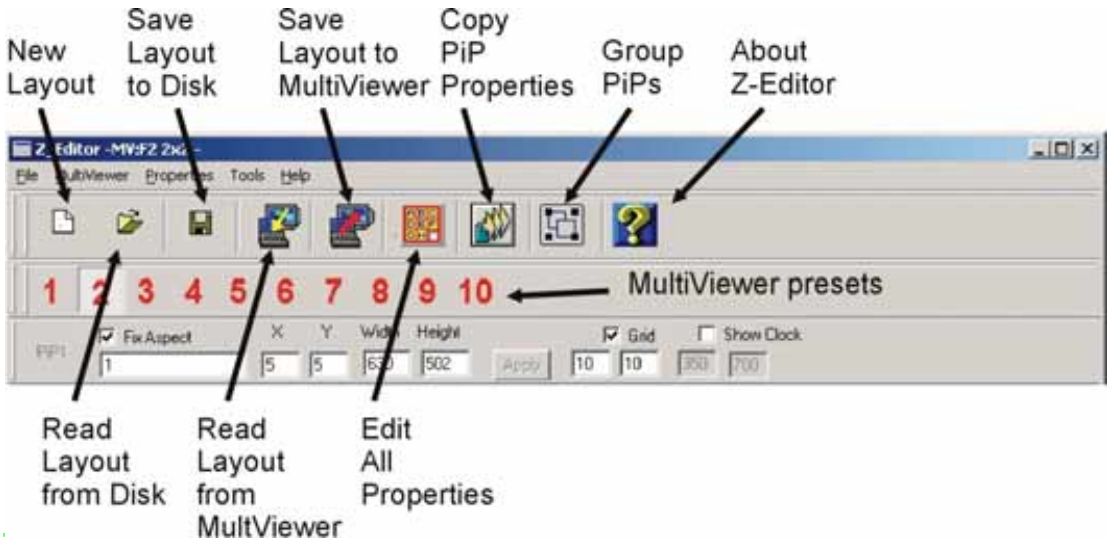

Figure 18 Z_Editor tool bar shortcuts

Notes: Z_Editor does not have access to any of the advanced menu settings available at the MultiViewer front panel.

If an attempt is made to set a parameter not supported by Z_Editor, a warning message will be given.

System properties are only saved from Z_Editor by using the Save to File command accessed from the Properties menu (Properties >> Save >> To File).

Accessing properties

The Properties menu or the Edit All Properties button provides access to the Show PiP, Windows Co-ordinates, PiP Labels and System Properties tabs.

Showing and hiding PiPs

Use the Show PiP tab to display or hide individual PiPs and to set each channel's input properties.

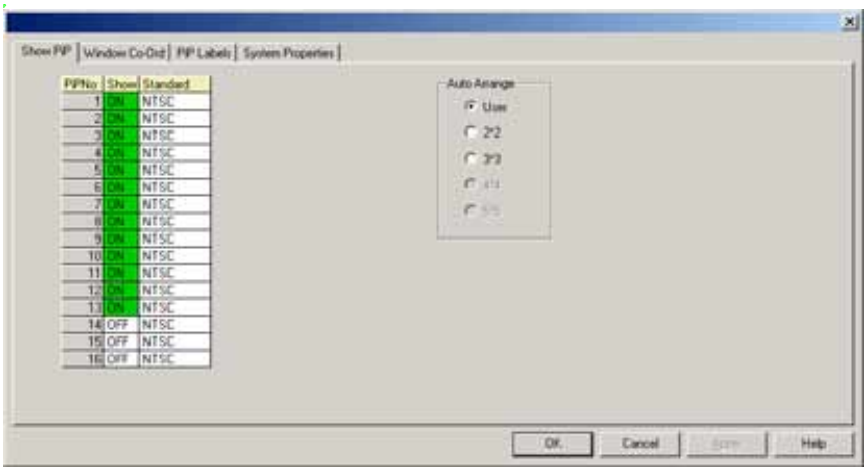

Figure 19: Input Properties

Setting window co-ordinates

The Windows Co-ordinates tab allows each PiP to be accurately defined in terms of position, size, border margins and crop values.

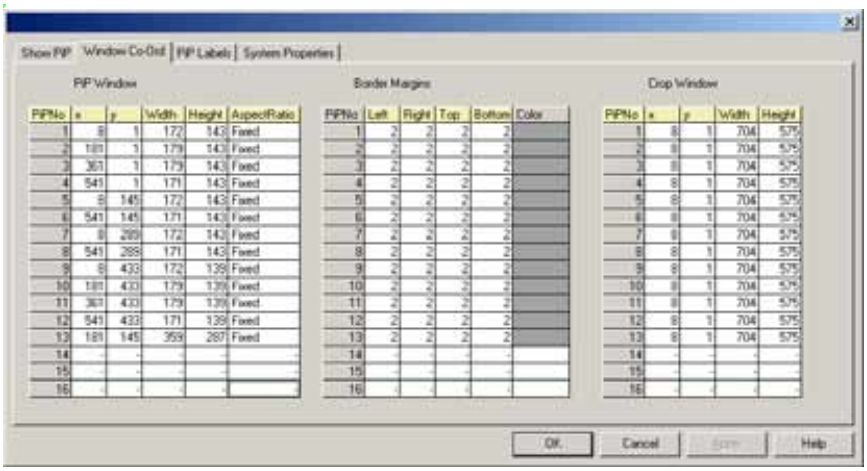

Figure 20: Window Co-ordinates

Click on a PiP window line-entry to open an edit menu.

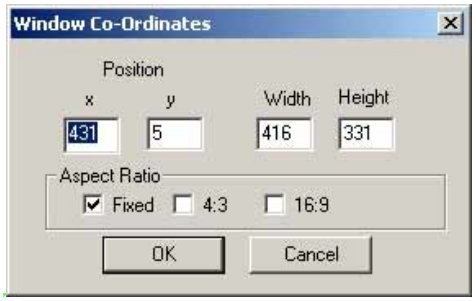

Figure 21: Edit Window Co-ordinates

The window co-ordinates are the size and position of the PiP window in which the PiP video and border will appear. Values are (approximately) in screen pixels relative to the top left hand corner of the screen.

Click on a PiP border line-entry to open an edit menu.

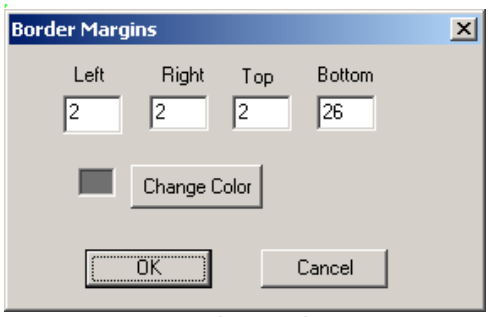

Figure 22: Edit Border Position

The values are the thickness of the border on each side of the PiP window. Border values are subtracted from the PiP window to yield the PiP video window.

Click on a Crop window line-entry to open an edit crop menu.

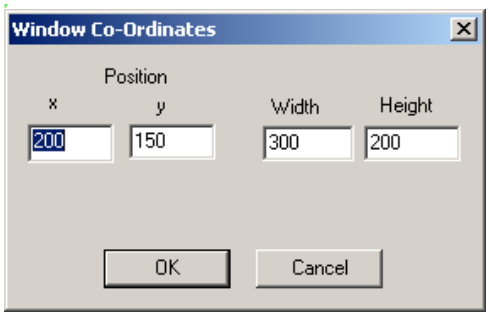

Figure 23: Edit Crop Window Co-ordinates

The crop window co-ordinates define the area of the source PiP video that will be used to fill the PiP video window. The smaller the area of the source video chosen, the more the video will appear zoomed in. The values shown in Figure 23, take the central area of the source video to fill the PiP video window. Both sides, and the top and bottom of the video are cropped and do not appear in the output.

Values are (approximately) in screen pixels relative to the top left hand corner of the PiP window.

Setting label properties

Use the PiP Label menu to determine Label Properties.

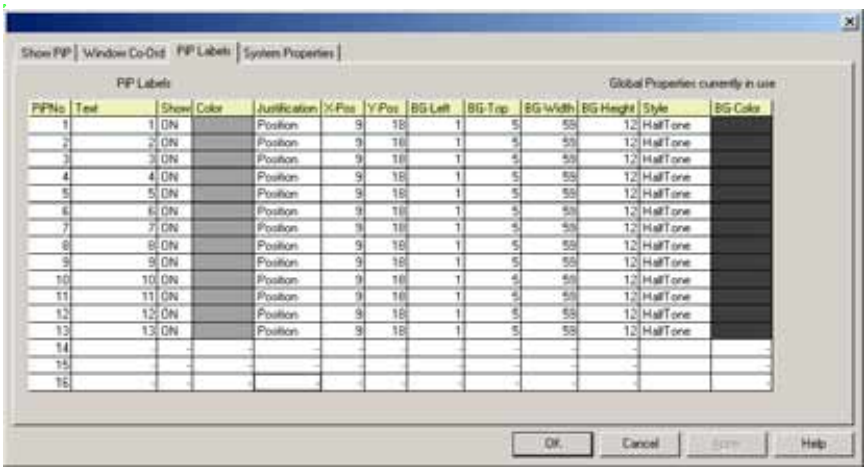

Figure 24: PiP Labels

Click on a PiP line-entry to open an edit menu.

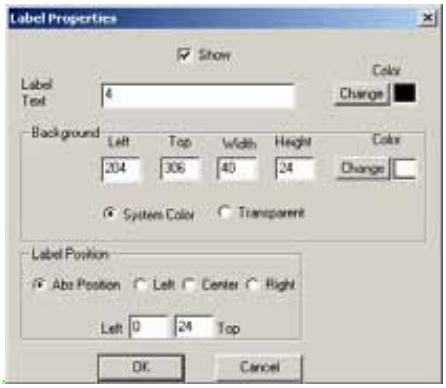

Figure 25:Edit Label Properties

Setting system properties

Click on the System Properties tab to set background color and drawing grid.

Figure 26: System Properties

System properties also reads and displays the total number of PiPs in the current layout.

Notes: If an attempt is made to set a parameter not supported by Z_Editor, a warning message will be given.

System properties are only saved from Z_Editor by using the Save to File command accessed from the Properties menu (Properties >> Save >> To File).

Using layering

The DX range of MultiViewers support overlapped PiPs.

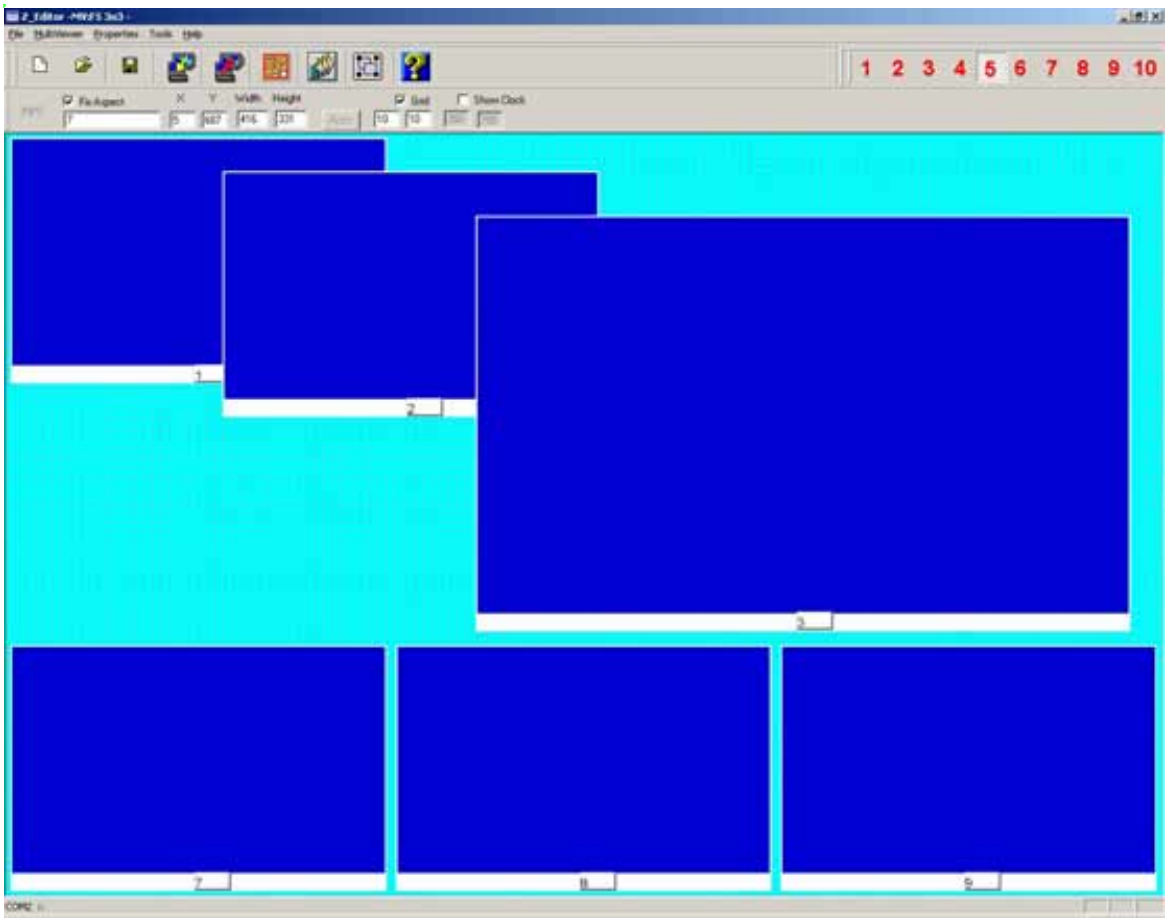

Figure 27: Z_Editor showing modified 3x3 PiP layout

The PiP with the highest priority (shown on top of the others) is always the last PiP clicked on with the mouse.

To arrange the PiPs 1, 2 and 3 shown above simply click on them in the order 1, 2 and then 3.

Creating a new layout

A new layout can be created by editing an existing one or by starting from scratch.

To create a new layout proceed as follows:

- Click on the New File button to create a blank layout file
- Use the Edit All Properties/Show PiPs tab to turn PiPs on which can be positioned by setting co-ordinates or by dragging with a mouse
- Design borders and labels as required
- Save the file to either a preset location on the MultiViewer or to a file on a hard disk.

Loading and saving layouts

Use the Save or Save As commands under the file menu to save layouts, which are saved to the attached PC storage in XML format.

Once connected, layouts can be saved to any preset on the MultiViewer and made active.

Click on the 'Send Layout to MultiViewer icon' to save a layout to a preset.

Select the preset by highlighting it.

To make the layout the currently active Preset, check the Make Active Preset box and click OK.

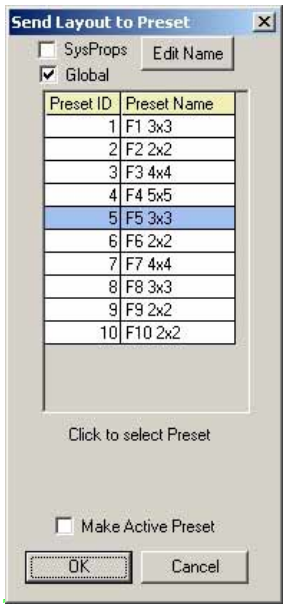

Figure 28: Send Layout to Preset

Global properties

Zandar MultiViewers support the use of Global Properties to allow Channel Labels and PiP border colors to be preserved as style information that can be applied across all layout/files. Global Properties are a useful way of ensuring that PiP label text and colors and PiP border colors will always be consistent across a range of layouts.

Global Properties are only handled correctly from the front LCD control panel.

If Z_Editor is launched when the attached DX MultiViewer has Global Properties turned on, the following warning will be shown:

Figure 29: Global Properties

Offline mode

If Z_Editor is launched and no Zandar MultiViewer can be found, offline mode is entered by default and the following message is displayed:

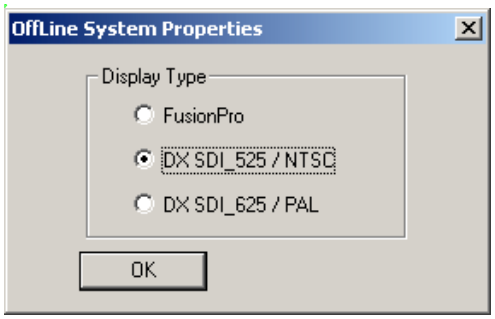

Figure 30: Offline display type

New layouts can be created in offline mode but not saved to a MultiViewer until one is connected.

Remote Control

The DX series of MultiViewers are equipped with both RS232 and RS422 serial ports. Either port may be selected using the front control panel to control one or more DX units via an ASCII text based Command Line Interface.

Multiple units may be controlled using multidrop (daisy-chained) wiring by using a unique system address before each command.

The port not selected for the CLI should be used to link to any optional ZAM In-Picture Audio Meter.

Zandar MultiViewers may be controlled by a set of built-in functional commands and from a range of extensible Z_Protocol commands. This chapter deals with the built-in functional commands. Please refer to the Z_Protocol manual for details of the extensible Z_Protocol command set.

Hardware configuration

The Baud Rate for either port may be selected from the front control panel or the CLI BAUD command.

COM Port	Setting
Baud Rate	57600
No of Bits	8 bits
Parity	None
Stop Bit	1
Flow Control	None

Table 39: Default RS232/RS422 Port Hardware Setup

Note: The ZAM requires 115,200 Baud for correct operation.

The Command Line Interface

The CLI supports the following functional commands.

ECHO_ON	ECHO_OFF	PIP_TXT_SET	PIP_TXT_OFF	PIP_TEXT_SOURCE
BORDER_ON	BORDER_OFF	BORDER_COLOR	BORDER_SOURCE	CAPTION_SET
CAPTION_OFF	CAPTION_SOURCE	CLOCK_ON	CLOCK_OFF	CLOCK_ATTR
READ_CLOCK	SET_CLOCK	CLOCK_SOURCE	SETUP_OP	TEST_PATTERN_ON
TEST_PATTERN_OFF	DISPLAY	FULLSCREEN	FULLSCREEN_RET	OUTPUT_FADER
RS232_WRITE	RS422_WRITE	FONT_SIZE	SETUP_TALLY	TALLY
TALLY_OFF	GPI_READ	GPO_SET	SET_MUL_TALLY	RESET_MUL_TALLY
SET_PIP_TXT2	RESET_PIP_TXT2	BAUD	READ_SYNC_STATUS	READ_PIP_DATA
PIP_FREEZE	PIP_UNFREEZE	BG_COLOR	PIP_COLOR	READ_ALARM
<nn>				

Table 40: The DX-16 Remote Control Commands

The command list is written from the perspective of the controller. The controller initiates commands and the receiver such as the DX RS232 or RS422 control, responds in slave mode to those commands.

When a command has been issued and if a CR and or LF is sent, a CR/LF sequence is echoed back to the controller followed by the command prompt '>'. This indicates that the system is ready to accept the next command line.

All commands and their arguments are case insensitive with the exception of text.

Where commands send data in Hex format or where Hex data is returned by a command, the data can be interpreted in binary format.

Example

```
>READ_SYNC_STATUS CR/LF
3 (0000000000000011 binary)
```

READ_SYNC_STATUS returns an integer in hexadecimal format, when viewed in binary form the binary bits represent the sync status of each card. Logic high indicates a sync lock and Logic low indicates a sync loss. The LSB is mapped to PIP 1 and the MSB is mapped to PIP 16.

In the above example, PiP 1 and 2 are sync locked whilst the remaining PiPs are not sync locked.

To indicate an error in the command sequence the RS232 or RS422 control will return 'FC' (false command) or 'FS' (false argument), followed by CR/LF before the next command prompt '>'.

Multidrop protocol

To issue a command to a specific unit in a multidrop configuration, add the following two-character address before each command: <nn>, where nn is the system number in decimal. The address must be two characters long, so for systems between 0 and 9, a leading '0' must be added.

Example **<03> DISPLAY 1 CR/LF**

Shows Display Layout 1 on DX_System number 03.

Notes: Opt denotes optional commands.
CR/LF is used to indicate a carriage return and linefeed.
Non-multidrop commands do not have a preceding '<' character.

DX Color Palette

The DX has a built-in color palette, which it uses for the colors of the borders, PiP labels, caption text, clock and date display.

The DX uses an 8 bit value to define a pixel color. The following table defines some of the output colors that can be obtained for specific pixel values.

Color	Pixel Value (Hex)	R	G	B
GrayScale	00-0f	1-16	1-16	1-16
Yellow	1B	12	12	0
Cyan	29	0	12	12
Green	37	0	12	0
Magenta	45	12	0	12
Red	54	12	0	0
Blue	62	0	0	12
Orange	77	12	6	0
	80	12	11	6
	90	7	13	13
	A0	8	13	8
	B0	12	5	11
	C0	13	7	7
	D0	9	8	14
Transparent Video	E0			
Half Tone Video	F0			

Table 41: Color Palette

Notes: The Pixel value 0xF0 is a special value, which defines half tone video behind labels.

The lowest nibble of the 8bit Pixel value varies a gray scale on the output color.

The table above defines colors for the DX display, which lie inside the range of colors allowed for CCIR video signals. Choosing different pixel values from the table above may result in colors that lie outside the color range allowed for CCIR video signals (i.e. saturated colors).

The CLI command directory

ECHO_ON

ECHO_ON CR/LF

Enable echo of every character sent by the controller.

Example **>ECHO_ON CR/LF**

ECHO_OFF

ECHO_OFF CR/LF

Disable echo of every character sent by the controller. Only data and control codes originating from the Host system are sent back to the controller.

Example **>ECHO_OFF CR/LF**

PIP_TXT_SET

PIP_TXT_SET [PiPID No][Text][FGColor][BGColor][POS-X][POS-Y] CR/LF

Changes the label of a PiP window on the output display.

Parameter	Description	Value
PiPID:	Specifies PiP Number	1 to 16
Text:	Specifies label text	Up to 16 characters*
FGColor:	Foreground Color (Must be a HEX number e.g. 0x00)	See color palette
BGColor:	Background Color (Must be a HEX number e.g. 0x00)	See color palette
POS-X:	Horizontal Text Position	0 to PIP Width in Pixels
POS-Y:	Vertical Text Position	0 to PIP Height in Pixels

Note: *Upper and lower alphanumeric characters and symbols +, #, =, - . /

Space character must be represented with '_' (underscore character), unless text is enclosed in optional single quotes.

Previous values for FGColor, BGColor and POS used if new values omitted

Examples **>PIP_TXT_SET 2 CAMERA_1 CR/LF**

>PIP_TXT_SET 3 'SAT 2 Feed' 0x00 0x0f 20 20 CR/LF

PIP_TXT_OFF

PIP_TXT_OFF [PiPID No] CR/LF

Hides the PIP label on the output display. By default the label is displayed.

PiPID: Specifies PiP Number

Example **> PIP_TXT_OFF 2 CR/LF**

PIP_TXT_SOURCE

PIP_TXT_SOURCE [Source] CR/LF

Determines Global or Layout/File settings from the Z_Editor Layout Editor.

Source: Source = 1 for File, Source = 0 for Global

Example *PIP text settings saved with layout/files*

>PIP_TXT_SOURCE 1 CR/LF

BORDER_ON

BORDER_ON CR/LF

Turn on borders around each PIP.

Example **>BORDER_ON CR/LF**

BORDER_OFF

BORDER_OFF CR/LF

Turns off borders around each PIP.

Example **>BORDER_OFF CR/LF**

BORDER_COLOR

BORDER_COLOR [COLOR]CR/LF

Sets the color of all PIP's borders. Refer to DX Color Palette for values.

Example *Change Border color to Yellow*

>BORDER_COLOR 0x1B CR/LF

BORDER_SOURCE

BORDER_SOURCE [Source] CR/LF

Determines Global or Layout/File settings from the Z_Editor Layout Editor.

Source: Source = 1 for File, Source = 0 for Global

Example *Border settings saved with layout/files*

>BORDER_SOURCE 1 CR/LF

CAPTION_SET

CAPTION_SET [Text][FGColor][BGColor][X-POS] [Y-POS]

Defines the text content of the caption.

Parameter	Description	Value
Text:	Specifies caption text	Up to 16 characters*
FGColor:	Foreground Color (Must be a HEX number e.g. 0x00)	Refer to color palette
BGColor:	Background Color (Must be a HEX number e.g. 0x00)	Refer to color palette
X-POS:	Horizontal text position	0 to 719
Y-POS:	Vertical text position	0 to 576

Note: *Upper and lower alphanumeric characters and symbols +, #, =, - . /

Use '_' (underscore character) for space character.

Take care with X-POS and Y-POS as extreme values may cause wrap-around.

Example *Set Caption to ZANDAR DX in white text against black in the center of the screen.*

> CAPTION_SET ZANDAR_DX 0x00 0x0f 100 100 CR/LF

CAPTION_OFF

CAPTION_OFF CR/LF

Turns off display of the caption.

Example **>CAPTION_OFF CR/LF**

CAPTION_SOURCE

CAPTION_SOURCE [Source] CR/LF

Determines Global or Layout/File settings from the Z_Editor Layout Editor.

Source: Source = 1 for File, Source=0 for Global

Example *Caption settings saved with layout/files*

>CAPTION_SOURCE 1 CR/LF

CLOCK_ON

CLOCK_ON CR/LF

Turns on display of the clock.

Note: After the CLOCK_ON command is issued it may take up to 3 seconds before the clock is displayed on the output display.

Example **>CLOCK_ON CR/LF**

CLOCK_OFF

CLOCK_OFF CR/LF

Turns off the display of the clock.

Example **>CLOCK_OFF CR/LF**

CLOCK_ATTR

CLOCK_ATTR[STYLE][X-POS][Y-POS] CR/LF

Defines the clock attributes, style and position.

Parameter	Description	Value
STYLE:	TIME	0
	DATE	1
	TIME & DATE	2
X-POS:	Horizontal text position	0 to 719
Y-POS:	Vertical text position	0 to 576

Note: 525 output assumes US style date e.g. 07-29-00
625 output assumes European date e.g. 29-07-00

Example *Clock with date displayed on top left hand corner of screen*

>CLOCK_ATTR 2 20 20 CR/LF

SET_CLOCK

SET_CLOCK [DATE][MONTH][YEAR][HRS][MINS] CR/LF

Sets the time and date.

Parameter	Description	Value
DATE:	Day of the month	1-31
MONTH:	Month of the year	1-12
YEAR:	Last two digits of the year	00-99
HRS:	Hours in 24 hour format	0-23
MINS:	Minutes	0-60

Example *Set Clock to 11:55 PM on 27 of December 2000*

> SET_CLOCK 27 12 00 23 55 CR/LF

READ_CLOCK

READ_CLOCK CR/LF

Reads the time and date.

Example **>READ_CLOCK CR/LF**

27-9-00 10:20:01>

CLOCK_SOURCE

CLOCK_SOURCE [Source] CR/LF

Determines Global or Layout/File settings from the Z_Editor Layout Editor.

Source: Source = 1 for File, Source = 0 for Global

Example *Clock settings saved with layout/files*

>CLOCK_SOURCE 1 CR/LF

SETUP_OP

SETUP_OP [FORMAT] CR/LF

Sets up the analogue output video display.

Parameter	Description	Value
FORMAT:	RGB	0
	YCrCB	1
	Comp_S_Video	2

Example *Setup Composite/S-Video Video Out*

>SETUP_OP 2 CR/LF

TEST_PATTERN_ON

TEST_PATTERN_ON CR/LF

Turns on the display of the 75% colorbar test pattern.

Example **>TEST_PATTERN_ON CR/LF**

TEST_PATTERN_OFF

TEST_PATTERN_OFF CR/LF

Turns off the display of the test pattern and restores normal output.

Example **>TEST_PATTERN_OFF CR/LF**

DISPLAY

DISPLAY [LAYOUT_ID]CR/LF

Selects and displays a new PiP layout/file.

LAYOUT_ID	Default layout	Input channels used
1	4x4	1-16
2	12+1	1-13
3	3x3	1-9
4	2x2	1-4
5	PRST1	1-12
6	PRST2	1-8
7	PRST3	1-8
8	PRST4	1-12

Example *Quad (2x2) display of PiPs 1-4*

>DISPLAY 4 CR/LF

FULLSCREEN

FULLSCREEN [PIPID]CR/LF

This command enlarges the selected input channel to full screen. Where PIPID selects the input channel and is in the range 1 to 16.

Example *Input channel 3 (PiP 3) to full screen display*

>FULLSCREEN 3 CR/LF

FULLSCREEN_RET

FULLSCREEN_RET CR/LF

This command returns the unit to the layout prior to the Full screen mode.

Example **>FULLSCREEN_RET CR/LF**

OUTPUT_FADER

OUTPUT_FADER [FADE] CR/LF

Fades the output video to black or from black to normal output levels. The fade occurs synchronously over 16 fields of video.

Parameter	Description	Value
FADE:	Fade to Black	1
	Return to normal levels	0

Example *Fade to Black*

>OUTPUT_FADER 1 CR/LF

RS232_WRITE

RS232_WRITE [STRING] CR/LF

Writes a string to the RS232 port.

Example *This is a test*

>RS232_WRITE This is a test CR/LF

RS422_WRITE

RS422_WRITE [STRING] CR/LF

Writes a string to the RS422 port.

Example *This is a test*

>RS422_WRITE This is a test CR/LF

FONT_SIZE

FONT_SIZE [SIZE] CR/LF

Change font size. Once the font is set all further characters created on the screen will be at that height. When a display is re-drawn all the characters will be the same size.

Parameter	Description	Value
SIZE:	Standard Size (Default)	1
	Double Size	2

Example *Change font size to double size*

>FONT_SIZE 2 CR/LF

SETUP_TALLY

SETUP_TALLY[Tally Type][X-POS][Y-POS][Size] CR/LF

Defines the Tally attributes, size and position.

Parameter	Description	Value
Tally Type:	Border	0
	Lamp	1
X-POS:	Horizontal Tally Lamp position relative to bottom left	0 to 800
Y-POS:	Vertical Tally Lamp position relative to bottom left	0 to 800
Size:	Tally Lamp where Size = horizontal and vertical size in pixels	Size = 1 – 99

Note: [X-POS][Y-POS][Size] are optional and only used for Tally Lamp
Tally Lamp is always square and Size is in screen pixels.

Example *Set tally type to Tally Lamp at bottom left hand corner, size 10 by 10*

>SETUP_TALLY 1 20 20 10 CR/LF

TALLY

TALLY [TALLYID No] [PiPID No] CR/LF

Sets the tally by changing the Tally Type (Border or Tally Lamp) to the selected TALLYID No (color) for the particular PIP. It is not possible to display more than one red or more than one green tally of the same type.

If a new and different PIP is tallied, any PIP currently showing the same tally color chosen for the new tally will have its tally turned off. If the Tally Type had been set to Border, it will revert to its previous border color. Any Tally Lamp of the same color will turn off.

Parameter	Tally color	Value
TALLYID No:	Green	1
	Red	2

Example *Set PiP 3 to TALLYID 1 (Green) AND Set PiP 2 to TALLYID 2 (Red)*

>TALLY 1 3 CR/LF

>TALLY 2 2 CR/LF

In the above example, PIP 3 will tally green and PIP 2 will tally red. The Tally Type will be as selected with the previous SETUP_TALLY command. The default is Type 0, Border.

Any previous use of the red and green TALLYID will be turned off.

TALLY_OFF

TALLY_OFF [TALLYID No] CR/LF

Turns off any tally of the *same color* selected by TALLYID No.

Example 1 *Turn off TALLYID 2 (any red tally)*

>TALLY_OFF 2 CR/LF

Example 2 *Turn off TALLYID 1 (any green tally)*

>TALLY_OFF 1 CR/LF

GPI_READ

GPI_READ CR/LF

Reads and returns the state of the GPI lines as a 16 bit hex number.

Example

>GPI_READ CR/LF

A3A2>

GPO_SET

GPO_SET CR/LF

Writes directly to the GPO lines as a 16 bit hex number.

Example

>GPO_SET 0xABCD CR/LF

SET_MUL_TALLY

SET_MUL_TALLY[PIP][Tally][Color][X-POS][Y-POS][Width][Height] CR/LF

Defines PiP Tally attributes, size and position.

Parameter	Description	Value
PIP:	PiP number	1 - 16
Tally:	PiP Tally Lamp	1 to 3
(Opt) Color:	Tally Lamp Color. Default- Tally 1: Red, Tally 2: Green, Tally 3: Yellow	See DX Palette
(Opt) X-POS:	Horizontal Tally Lamp position Default- Tally 1: 5, Tally 2: 10 Tally 3: 15	0 to PIP Width in pixels relative to PiP bottom left
(Opt) Y-POS:	Vertical Tally Lamp position Default All Tally: 5	0 to PIP Height in pixels relative to PiP bottom left
(Opt) Width:	Tally Lamp width. Default All Tally: 5	1 – 99 pixels
(Opt) Height:	Tally Lamp height. Default All Tally: 5	1 – 99 pixels

Example 1

Set PiP 4 Tally 2 yellow at PIP bottom left hand corner, size 10 by 10

>SET_MUL_TALLY 4 2 0X1B 0 0 10 10 CR/LF

Example 2

Set PiP 2 Tally 1 red 20 pixels from left and 20 pixels from bottom of PIP, size 20 by 20

>SET_MUL_TALLY 2 1 0X54 20 20 20 20 CR/LF

RESET_MUL_TALLY

RESET_MUL_TALLY[PIP][Tally][Color]CR/LF

Resets PiP Tally attributes, size and position.

Parameter	Description	Value
PIP:	PiP number	1 - 16
Tally:	PiP Tally Lamp	1 to 3
(Opt) Color	Tally Lamp color Default: Transparent OxEO	See DX Palette

Example *Reset Tally 2 for PiP 4 to transparent*

>RESET_MUL_TALLY 4 2 CR/LF

PIP_TXT2_SET

PIP_TXT2_SET[PIP][Text][FGColor][BGColor][X-POS][Y-POS] CR/LF

Defines second PIP UMD attributes, size and position.

Parameter	Description	Value
PIP:	PiP number	1 - 16
Text:	PiP label Text	Alphanumeric
(Opt) FGColor	Foreground Color Default: White	See DX Palette
(Opt) BGColor	Background Color Default: Half Tone	See DX Palette
(Opt) X-POS:	Horizontal position from PIP left Default: 5	0 to PIP Width in Pixels relative to top left
(Opt) Y-POS:	Vertical position from PIP top Default: 20	0 to PIP Height in Pixels relative to top left

Example 1 *Set text for PiP 4 to Zandar at default position and color*

>PIP_TXT2_SET 4 'Zandar' CR/LF

Example 2 *Set text for PiP 1 to 'Sports' 20 pixels from left and 20 pixels from top of PIP*

>PIP_TXT2_SET 1 Sports 20 20 CR/LF

PIP_TXT2_OFF

PIP_TXT2_OFF[PIP][FGColor][BGColor] CR/LF

Resets second PIP UMD color attributes

Parameter	Description	Value
PIP:	PiP number	1 - 16
(Opt) FGColor	Foreground Color Default: Transparent 0xE0	See DX Palette
(Opt) BGColor	Background Color Default: 0xE0	See DX Palette

Note: The first UMD is the PiP text.

Example *Reset PiP 4 to transparent UMD colors*

> PIP_TXT2_OFF 4 CR/LF

BAUD

BAUD[PORT][RATE]CR/LF

Sets up the baud rate for the RS232/RS422 serial ports. The first parameter selects the serial port (RS232 or RS422) while the second parameter selects one of three possible baud rates.

Parameter	Description	Value
PORT:	RS232	1
	RS422	2
RATE:	4,800 Baud	4800
	9,600 Baud	9600
	19,200 Baud	19200
	38,400 Baud	38400
	57,600 Baud	57600
	115,200 Baud	115200

Example *Setup RS232 for 57600 Baud*

>BAUD 1 57600 CR/LF

READ_SYNC_STATUS

READ_SYNC_STATUS CR/LF

Returns an integer in hexadecimal format. When viewed in binary form the binary bits represent the sync status of each card. Logic high indicates a sync lock and Logic low indicates a sync loss. The LSB is mapped to PIP 1 and the MSB is mapped to PIP 16.

Example 1 *PIP 1 and 2 are sync locked, the rest are not sync locked*

>READ_SYNC_STATUS CR/LF

3 (0000000000000011 binary)

Example 2 *PIPs 1 through 16 are all sync locked*

>READ_SYNC_STATUS CR/LF

FFFF (1111111111111111 binary)

READ_PIP_DATA

READ_PIP_DATA [Layouts] CR/LF

Returns the status and location of 16 PIPs, one PIP per line.

Parameter	Description	Value
Layout:	Layout Number	0 to 7

The data read back is in the following format:

PIP #,On /Off, PIP_Top, PIP_Bottom, PIP_Left, PIP_Right

Example *>READ_PIP_DATA 3 CR/LF*

```
PIP 1,ON,1,288,8,360
PIP 2,ON,1,288,361,712
PIP 3,ON,289,572,8,360
PIP 4,ON,289,572,361,712
PIP 5,OFF,1,144,8,180
PIP 6,OFF,1,144,8,180
PIP 7,OFF,1,144,8,180
PIP 8,OFF,1,144,8,180
PIP 9,OFF,1,144,8,180
PIP 10,OFF,1,144,8,180
PIP 11,OFF,1,144,8,180
PIP 12,OFF,1,144,8,180
PIP 13,OFF,1,144,8,180
PIP 14,OFF,1,144,8,180
PIP 15,OFF,1,144,8,180
PIP 16,OFF,1,144,8,180
```

Note: Co-ordinates are diagonal corners of PiP.

PIP_FREEZE

PIP_FREEZE [PiPID No] CR/LF

Freezes the video within a PIP.

Example *Freeze PiP 3*

>PIP_FREEZE 3 CR/LF

PIP_UNFREEZE

PIP_UNFREEZE [PiPID No] CR/LF

Unfreezes the video within a PIP.

Example *Unfreeze PiP 3*

>PIP_UNFREEZE 3 CR/LF

BG_COLOR

BG_COLOR [XX] CR/LF

Selects background color, where XX is color.

Example *Set background to red*

>BG_COLOR 54 CR/LF

PIP_COLOR

PIP_COLOR [n] [X] CR/LF

Displays selected PiP in black and white where n is PiP number and X is 1 for B&W and 0 for color.

Example *SetPiP 2 to black and white*

>PIP_COLOR 2 1 CR/LF

READ_ALARM

READ_ALARM CR/LF

Returns status of video and audio alarms. The various alarms are delimited by the '|' character. All data is sent back in Hex format in the following order:

Parameter	Description
Sync Loss Status:	16 Alarms, 1 per PIP. LSB of Hex number is PIP 1. MSB of Hex number is PIP16
Black Picture Status:	16 Alarms, 1 per PIP. LSB of Hex number is PIP 1. MSB of Hex number is PIP16
Frozen Picture Status	16 Alarms, 1 per PIP. LSB of Hex number is PIP 1. MSB of Hex number is PIP16
Number of Audio Bars per PIP	This is 2 or 4 depending on the Audio Setup
Audio Loss Status	64 Alarms, 1 per Audio Bar. LSB of Hex number is Bar 1, MSB of number is Bar 64. Each 16 Bars are delimited by '|'
Audio Carrier Loss Status	64 Alarms, 1 per Audio Bar. LSB of Hex number is Bar 1, MSB of number is Bar 64. Each 16 Bars are delimited by '|'
Audio Over Level Status	64 Alarms, 1 per Audio Bar. LSB of Hex number is Bar 1, MSB of number is Bar 64. Each 16 Bars are delimited by '|'
Audio Anti Phase Status	64 Alarms, 1 per Audio Bar. LSB of Hex number is Bar 1, MSB of number is Bar 64. Each 16 Bars are delimited by '|'
ZAM Data Status	64 Alarms, 1 per Audio Bar. LSB of Hex number is Bar 1, MSB of number is Bar 64. Each 16 Bars are delimited by '|'

Example

See next page for meaning in terms of active alarms

> READ_ALARM CR/LF

|F000|F|1010|4|0|0|0|FFFF|F000|0|0|0|0|0|F|0||0|0|F|0|FFFF|FFFF|FFFF|FFFF|

To read the returned code convert to binary.

For example F000 Hex is 1111 0000 0000 0000 in binary. This provides four 1's in position 16, 15, 14 and 13. If F000 is returned for Sync Loss Status, it means that PIP's 13 - 16 have Sync Loss.

READ_ALARM example returned code	*Meaning*
|F000|	PIP's 13 - 16 have Sync Loss
|F|	PIP's 1-4 have Black Picture Alarm
|1010|	PIP's 5 and 13 have Frozen Picture Alarm
|4|	4 Audio Bars per PIP (either 2 or 4)
|0|0|0|FFFF|	Bar 1 to 16 have Audio Loss Alarm
|F000|0|0|0|	Bar 61 to 64 have Audio Carrier Loss Alarm
|0|0|F|0|	Bar 17 to 20 have Audio Over Level Alarm
|0|0|F|0|	Bar 17 to 20 have Audio Anti Phase Alarm
|FFFF|FFFF|FFFF|FFFF|	All Bars have ZAM Alarm

<nn>

<nn>

Used to precede command for specific unit in a multidrop configuration, where 'nn' is unique address from 00 to 99.

Example *To show Display 1 on DX system 03*

<03> DISPLAY 1 CR/LF

Trouble shooting

How long should a DX unit take to boot up?

The boot up time should complete in 20 to 25 seconds.

What is the normal boot up LCD display sequence?

The normal boot up LCD display sequence is as follows:

1) At switch-on display shows version number then…
2) Initializing system. (one dot)
3) Initializing system.. continued (two dots)
4) Initializing system… continued (three dots)
5) Initialization completed – 4/16 PiP system displayed
6) First menu shown is PAL/NTSC Menu - System Setup

What hardware checks are performed during the boot up procedure?

During the initial power-up sequence, the embedded processor runs basic checks on the installed hardware to ensure that it is present and that any required firmware is in place and passes validity tests. If this is successful, the System Setup menu is displayed on the LCD screen and the unit should be ready for use.

If a fault is detected during boot up, a message is displayed and an audible beep will be heard.

What is an FPGA error?

These messages indicate a power up initialization failure. One of the first tasks done after a power on reset is for the CPU to download firmware into programmable logic devices (known as FPGAs).

If the initialization system fails to complete one or more FPGA messages appear. If these errors have occurred after a firmware upgrade, try running the upgrade again.

What do FPGA errors mean?

FPGA errors may appear in the form FPGA error # nn, where 'nn' may be one or more of the following:

'nn' value	Daughter board
1	DMV4 #1
2	DMV4 #2
4	DMV4 #3
8	DMV4 #4
16	Base board

For example, if FPGA error 5 appears, this means that DMV4 #1 and DMV4 #3 have failed. If the error persists after upgrading the firmware and power cycling the unit, it may be necessary to replace the affected DMV4 daughter board(s).

What do I check if the MultiViewer fails to respond correctly to commands?

Power cycle the unit and/or recall factory defaults.

Observe boot-up initialization procedure for messages or warnings on the LCD screen.

Why does the external display attached to my VGA output have poor image quality?

Most display problems can be traced to output display scaling artifacts or simply poor cabling. Correcting these errors usually requires either configuration changes or fitting higher quality VGA cables.

What are 'scaling artifacts' and how do I avoid them?

Scaling errors can occur when a display device connected to a VGA output is forced to re-scale an image by interpolating new pixels because the display resolution generated by the MultiViewer output does not match the native display resolution supported by the display device. The interpolation process often introduces scaling artifacts and will soften or degrade the resultant displayed image.

To avoid scaling errors, check the native resolution of the display device and wherever possible, configure the output of the MultiViewer to match the display's native resolution.

What is 'ghosting' and how do I avoid it?

This term refers to vertical fringing artifacts. Using incorrectly specified VGA cable or twisted pair connections most often cause this problem. Always use high quality RF screened VGA cable with individual coaxial cables for each of the red, green and blue signals of the VGA output.

What calibration adjustments are there on the attached display itself?

The attached display device should always be properly calibrated to ensure high quality picture. This applies particularly to digital display devices such as Plasmas and LCDs.

The DX unit has a color bar text signal built in. If a FusionPro is available, a range of useful patterns including checkerboard can be used to calibrate the display device properly.

What is the typical video delay of a DX system?

The default video delay of a DX unit is one frame.

Can PiP inputs be cropped?

Yes. Z-Editor supports cropping.

What should be checked if the output signal fails?

Check that there is power to the MultiViewer unit and that it is turned on.

Check inlet power fuse(s).

Check that one or more valid input signal(s) are connected and that the chosen PiPs or Tiles correspond to valid input(s).

If analogue outputs are used, check that the format (RGB or YUV or S-Video (Y-C) and Composite Video) is correct.

If the VGA output is used check that any VGA monitor is capable of locking to the vertical scanning rate (50Hz in 625 or PAL, 60Hz in 525 or NTSC). Use high quality RFI screened multiple 75-Ohm coax.

Why doesn't Z_Editor load any layouts from the DX?

Ensure that a standard null-modem serial cable is connected from the chosen PC Com port to the RS232 port of the DX.

Check that Z_Editor is configured for the correct PC port and that it is enabled and not in use by another application

Ensure that the RS232 port of the DX is set to 57,600 Baud.

Check that the CLI interface is set to the RS232 port

What is a null modem cable?

A serial cable designed to connect a PC RS232 port directly to a controlled device with (typically) pin 2 and 3 crossed-over.

Why do some video tiles appear to have an incorrect format?

Try to ensure that the output line standard is selected to be the same as the majority of the inputs.

If the Z_Editor, User Layout GUI has been used, check that the aspect ratio was chosen as required.

Why do moving images judder in some video tiles?

Whilst the MulitViewer is not a standards converter, most moving images can be input as one line standard and output as another – however if there is significant frame to frame movement, some judder may result.

Try to ensure that input and output line standards are the same where possible.

Why can't I change output format between PAL/625 and NTSC/525?

This can only be done by recalling FACTORY SETTINGS from the front panel.

Why does Border tally not work?

Check that Tally function has not been turned off.

Check that the normal border color is not RED as this is the tally color and will not be seen.

Check that a valid GPI signal is being received.

Why can't the tally lamp color be changed from the front control panel?

The default Tally Lamp color (red) can only be changed from the serial interface.

Why can't I scale PiPs beyond ¼ size?

At present PiPs can only be scaled up to its native incoming resolution (for example PAL 720*576 or NTSC 720*480).

Why do images tend to look 'cropped' in PAL/625 out?

The DMV4 input card provides 393,216 pixels. However full screen PAL images normally require 720 x 576 (414,720) pixels. For this reason the screen image in PAL/625 out may be automatically cropped and/or re-scaled for optimum results.

Why do full screen images tear with asynchronous inputs?

Scaled down windows are recommended with asynchronous sources to prevent tearing.

Asynchronous inputs are only handled correctly when two frames of video are stored. There is however, insufficient memory for two frames to be stored beyond 495 x 396 pixels.

Why is the bargraph response and level incorrect for the scale chosen?

Check that the ZAM scale size is set to HALF.

Check that the ZAM internal TV standard is set to PAL.

Check that the SAME scale has been selected in the ZAM and DX MultiViewer.

ZAM Audio Bars do not display but Alarm Data shows ZZ, why is this?

Check that the port settings are correct for units connected.

Check the serial link cable. If RS232 communication is used it should be no more than 3 meters from DX to ZAM.

Ensure that Baud rate is 115,200 for ZAM control.

Check that the ZAM is powered.

Why does the command Line Interface not function?

Check that the appropriate port type is selected (RS232/RS422).

Check that the correct port configuration is employed.

Check that the cabling and any terminal or remote device configuration is correct.

Note: The ZAM will use the port (RS232 or RS422) which is not selected for the Command Line Interface as the ZAM data port. Ensure that the port used for the ZAM matches its factory supplied port configuration.

Specification

Video inputs	Composite Video/SDI, BNC connectors, Input impedance 75Ω SDI input to SMPTE 259M, input return loss >15dB 525 (NTSC): 525 lines, H Sync – 15.750 kHz, V Sync – 60 Hz 625 (PAL): 625 lines, H Sync – 15.625 kHz, V Sync – 50 Hz
Outputs	Two Serial Digital outputs to SMPTE 259M in 525 or 625 lines. One of RGB or YUV or S-Video (Y-C) and Composite Video Video Amplitude: 1V pk-pk, NTSC or PAL, 25/30 fps video update rate One VGA Progressive Scan output in RGBHV format
Synchronization	393,216 pixel 'time-base' correction memory on each input. Asynchronous inputs fully supported without tearing below 495 x 396 output screen size Line Sync input 15.7 kHz +/- 4%
Output picture resolution	525: 704 pixels per line, pixel width 74ns, 480 active lines 625: 704 pixels per line, 576 active lines 625 Full Screen: 694 pixels per line, 566 active lines VGA, Progressive Scan to 720 X 480@60Hz in 525 out, Progressive Scan to 704 x 625@50Hz (576 active lines) in 625 out Digital color encoding, 4:2:2 image reconstruction, 10 bit D/A, 2 x oversampled reconstruction
Filtering	Horizontal and Vertical Filtering in real time, 13.5 MHz, 6 tap horizontal and 5 line vertical FIR decimation filter
Text / graphics	Video channel labeling / window borders, 16 colors
Housing	19" Rack Mount: 1U high. Outline Dimensions: 434mm(W) x 470mm(D) x 44mm(H)
Power	110V / 60 Hz or 220V / 50 Hz, auto detected

Environmental	Temperature 0°C to 28°C, Storage is 0 to 50 degrees, Humidity 70% max.
Front panel	Power on/off, 6 configuration buttons, 6 menu buttons
Rear panel	Video I/O BNC connectors, VGA connector, RS232, RS422, GPI, GPO connectors
Computer interface	9 pin RS232 and RS422 male PC-AT serial interfaces

Approvals and warranty

Regulatory Approvals

Notice of CE Compliance

The CE Mark

CE Product Emission Standard EN 55 022:1994

CE Generic Immunity Standard 50082-1:1992

(as per the EMC Directive 89/336/EEC)

Shielded interface cables should be used with this equipment to ensure compliance with CE specifications.

Disclaimer: Changes or modifications to this equipment not expressly approved by the manufacturer responsible for the compliance could void the user's authority to operate the equipment.

Notice of FCC Compliance

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 their own expense.

Disclaimer: Changes or modifications not expressly approved by Zandar Technologies could void the user's authority to operate the equipment.

Warranty

This product has a warranty against defects in material and workmanship for a period of one year from date of shipment.

If you discover a defect, Zandar Technologies will, at its sole option, repair or exchange the product, provided you have registered the product and contact Zandar Technologies Technical Support to obtain a Return Material Authorization (RMA) Number and instructions on where and how to obtain repair.

Registration

Please fill in the PRODUCT REGISTRATION FORM enclosed with this User's Guide or simply email info@zandar.com providing your contact details and product details, including the Serial Number.

Appendix 1

Channel upgrade

Follow these steps to install an additional DMV4 four input module into a DX system:

- Turn off the DX unit and disconnect the mains
- Remove the top lid of the DX unit
- Refer to the DX drawing below to determine the correct site for insertion of the additional DMV4 module
- Insert the module into the next available module connector
- Secure the module onto the fixing columns with the supplied screws
- Re attach the lid of the DX unit
- Connect the mains, the DX unit will automatically configure the new DMV4 module

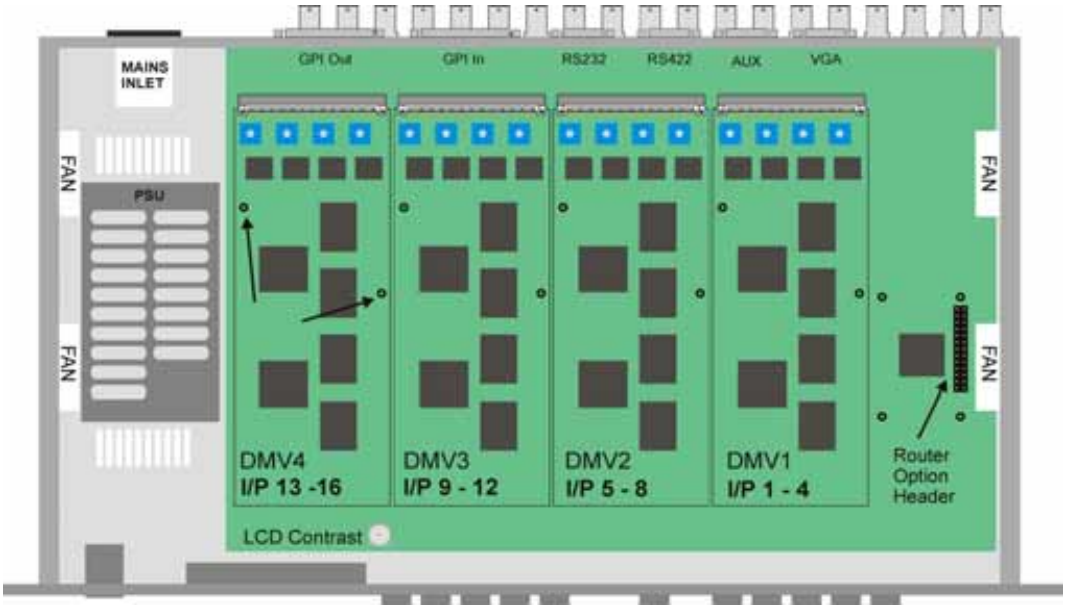

Figure31: The DX unit with the top removed

Note: Read Warnings at the beginning of installation chapter before carrying out service.

Router upgrade

Router upgrade kit contents

- Router PCB
- 4 M3 5mm Screws
- Interface cables (RS232 and RS422/485)

Follow these steps to install the Router into a DX system:

- Turn off the DX unit and disconnect the mains cable
- Remove the top lid of the DX unit
- Insert the router board into CN9 located at the right (from the front) and screw down
- Remove the connector from the AUX port on the rear of the DX
- Insert one of the supplied cables (RS232 or RS422/485) into the AUX port and connect the other end to the RS232 or RS422/485 header depending on the interface to the external router
- Replace the DX Lid and reconnect the mains cable

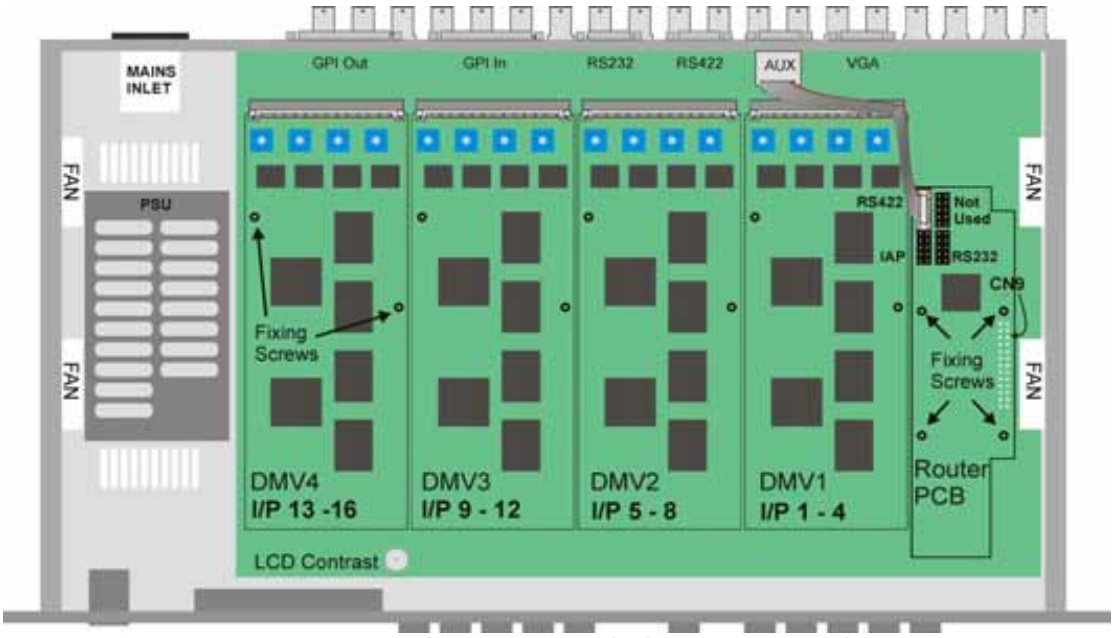

Figure 32: The DX unit with the top removed

Note: If an AUX port is not fitted, the existing RS232 or RS422 ports could be used for the router interface, if not required for CLI and ZAM connections

Read Warnings at the beginning of instalation chapter before carrying out service.

Router Configuration

To configure the DX Router Option proceed as follows:

- Power up the DX
- Under the System Menu go to Router Setup and set 'Use ?' to Yes
- Set the Baud rate to match the router baud rate
- Set the port to match the router port standard
- Set the start address of the DX *
- The start address is ignored for RS232 port standards
- To turn off reading and display of the PIP label set Use PIP x : to False

* See individual router set-up information.

Router Protocols

Probel Multi-drop UMD

Emulation

The DX emulates 16 (DX16) or 4 (DX4) dual 8 character UMD's with a single tally each. The DX will display the second destination (Last 8 characters).

Device Poll

The DX responds to a Device Poll (<F4, Address> 4 wire) or

(F6, Address> 2 wire) with <FF> within 1.5ms.

Global Poll

The DX does not respond to Global Poll.

UMD Device Update

The DX implements the UMD Device Update as follows: -

<F3, Address, Display No, Control Byte 1, Control Byte 2, up to 16 ASCII Chars >

`Address:`	This is used as a PIP number
`Display Number:`	Only used to ensure that data is valid by checking that Display Number = Address + D0
`Control Byte 1:`	Use Bit 4 to turn tally on and off
`Control Byte 2:`	Use Bit 6 to see if ASCII data included.
`ASCII Data:`	If Bit 6 of Control Byte 2 is set to '0' then the DX ASSUMES that there are 16 bytes of data and displays the last 8.

Serial Interface

The Baud rate and port are set from the DX front panel menu.

The parity is always even.

Start Address

The DX Router board will map the PIP label data based on the start address.

Example:

Start address is set to 3. The DX will display PIP 1 label data for UMD device updates with address set to 3, PIP 2 label data UMD device updates with address set to 4 and sequentially from there on.

The DX Router board will only respond to a device poll if the DX has a matching address and Use Pip is set to yes.

For DX 16's the start address is normally set to 1. For other start addresses refer to 'Using multiple DX units' in the Audio Monitoring chapter of the main manual.

Thomson ASCII UMD

Emulation

The DX emulates 16 (DX16) or 4 (DX4) 8 character UMD's with a single tally each.

UMD Device Update

The DX implements the UMD device update as follows: -

ZDAANabcdefgh<cr>

ZD:	Command identification "display set"
AA:	First 'a' sets the unit number, second 'a' sets the PIP number
N:	Display number (not used)
abcdefgh:	Characters for the PIP Label
<cr>:	Carriage return (end of sync character)

Tally Led Update

ZTaantt

ZT:	Command identification "tally set"
aa:	First 'a' sets the unit number, second 'a' sets the PIP number
n:	Display number (not used)
tt:	First 't' sets the tally light (on = 1) or (off = 0), second 't' is not used.
<cr>:	Carriage return (end of sync character)

Serial Interface

The Baud rate and port are set from the DX front panel menu.

The parity is always none.

Start Address

The start address sets the unit number.