ViewZ®

INSTRUCTION MANUAL

VER 1.1

2018.8.6

Instruction Manual

Compact 1RU 16 Channel 3G-SDI VZ-MV1602-SDI Multiviewer

with 16×16 3G-SDI Matrix Switcher

This device is the perfect solution for a large broadcast project. One machine supports two modes, 16 channel SDI multiviewer mode and 16x16 SDI matrix switcher. The input signal detects SD, HD and 3G-SDI automatically. The video format of multiview outputs can be selected from total 9 formats from 720p to 1080p. There are 20 preset layouts including 16/12/11/10/9/8/6/4 for choices. You can even SOLO any input signal in full screen through the shortcut key. MMV16310 also supports UMD, audio meter, signal status and time code overlay. All functions can be quickly controlled by the PC software or front panel button & knob.

Default Mode: Multiviewer Mode

Connections

SDI Video Input

16×SD/HD/3G-SDI(75Ω BNC)

SDI Video Output

2×SD/HD/3G-SDI(75Ω BNC)

Control

Front panel button,

PC software via LAN/RS-422

SDI Video Loop Output

HDMI Video Output

Standards

SDI Inputs Format Support

(HD) 1920×1080p 60/59.94/50/30/29.97/25/24/23.98

(HD) 1920×1080PsF 30/29.97/25/24/23.98

(HD) 1920×1080i 60/59.94/50

(HD) 1280×720p 60/59.94/50

(HD) 1280×720p 30/29.97/25/24/23.98

(SD) 625i 50

(SD) 525i 59.94

SDI & HDMI Outputs Format Support

1080p 60/50/30/25/24
1080i 60/50

720p 60/50

SDI Auto Switching

Automatically detects SD, HD and 3G-SDI on inputs

SDI Video Rate

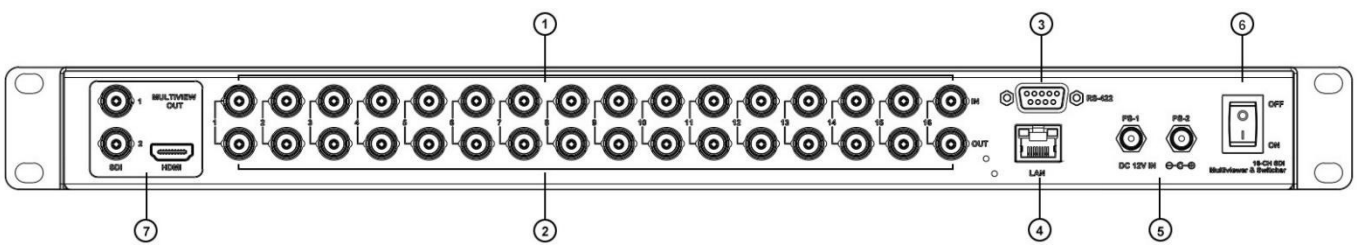
SD/HD/3G-SDI

SDI Compliance

SMPTE 292M, SMPTE 259M,

SMPTE 424M, SMPTE 352M,

Interfaces



① **Inputs**	SDI inputs 1-16	② **Loop Outputs**	SDI loop outputs 1-16
③ **RS-422**	Reserved for software control	④ **LAN**	Software control and update
⑤ **Power**	Dual power connectors PS-1 & PS-2, for power redundancy	⑥ **Power Switch**	To turn on or off the device
⑦ **Outputs**	Multiview outputs, SDI×2 & HDMI×1		

Second Mode: Switcher Mode

Connections

SDI Video Input

16×SD/HD/3G-SDI/DVI-ASI(75Ω BNC)

Control

Front panel button,
PC software via LAN/RS-232

Updates and Configuration

LAN(RJ45)

SDI Video Output

16×SD/HD/3G-SDI/DVI-ASI(75Ω BNC)

Standards

SDI Format Support

(2K) 2048×1080p 30/29.97/25/24/23.98

(2K) 2048×1080PsF 30/29.97/25/24/23.98

(HD) 1920×1080p 60/59.94/50/30/29.97/25/24/23.98

(HD) 1920×1080PsF 30/29.97/25/24/23.98

(HD) 1920×1080i 60/59.94/50

(HD) 1280×720p 60/59.94/50

(HD) 1280×720p 30/29.97/25/24/23.98

(SD) 625i 50

(SD) 525i 59.94

SDI Compliance

SMPTE 372M, SMPTE 259M,

SMPTE 292M, SMPTE 296M,

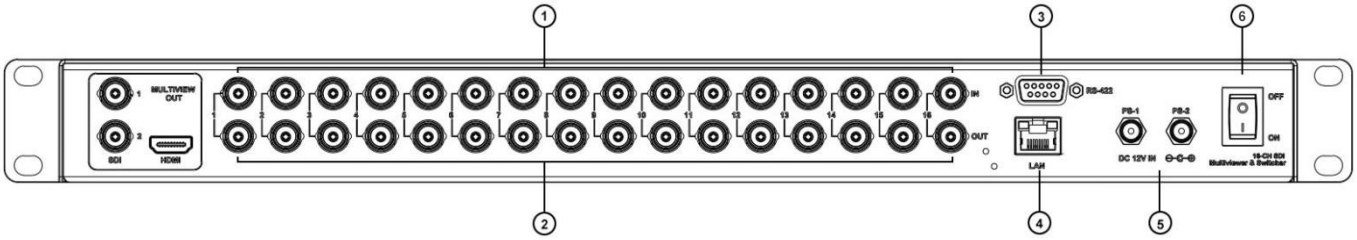
SMPTE 424M, SMPTE 425M,

DVB-ASI

SDI Color Space and Precision

RGB 4:4:4 10bit/12bit

Interfaces

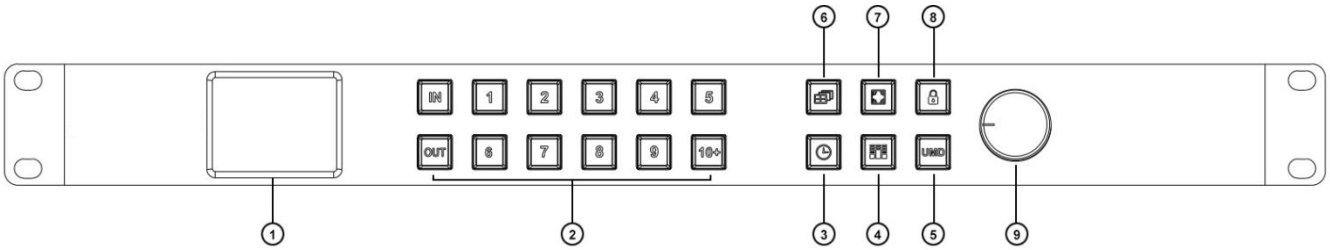


① **Inputs**	SDI inputs 1-16	② **Outputs**	SDI outputs 1-16
③ **RS-422**	Reserved for PC software control	④ **LAN**	PC software control and update
⑤ **Power**	Dual power connectors PS-1 & PS-2, for power redundancy	⑥ **Power Switch**	To turn on or off the device

Note: The mode of Multiviewer and Switcher can be switched by PC software or knob menu.

Controls

Front Panel Control



① **2.2 Inch LCD Display**	Show Device status and menu control
② **IN/OUT Buttons**	Input or output channel from 1 to 16 channel **1) Multiviewer Mode**

and Channel Buttons	- Switching an source to an window. press buttons “IN, 1, OUT, 2” to switch source 1 signal to window 2. - Switching an input to multiple windows. Press buttons “IN, 1, OUT, 2, 4, 5” to switch source 1 signal to windows 2, 4, 5. **2) Switcher Mode** - Switching an input to an output. press buttons “IN, 1, OUT, 2” to switch input 1 signal to output 2. - Switching an input to multiple outputs. Press buttons “IN, 1, OUT, 2, 4, 5” to switch input 1 signal to output 2, 4, 5. **3) Note** - Channel button over 10 need two buttons to combine, For example, 10= [10+] [10+], 11=[10+] [1], 12=[10+][2], ... ,16=[10+][6] - The OUT button indicator will automatically close after 8s. When it is off, you only need to press the OUT button again to continue the unperformed switch.
③ Time Code Button	Quick switch for Time Code overlays ON/OFF
④ Audio Meter Button	Quick switch for Audio Meter bars ON/OFF
⑤ UMD Button	Quick switch for UMD overlays ON/OFF
⑥ Multiview Layout Button	Quick switch between 20 kinds of multiviewer layouts
⑦ Full Screen Button	Press this button to activate the full screen mode; then select channel button to solo any inputs as full screen
⑧ Lock Button	Lock or unlock, press the button to Lock or unlock front panel buttons
⑨ Knob	Controls the menu. Turn anticlockwise=menu Up , Turn clockwise=menu down, Press down = Enter

PC Control

You can control the Multiviewer via web browser. The default IP address of Multiviewer is 192.168.1.215.

LAN Port Control Instruction

I. LAN Port Control

Method A) When connecting device with a router with DHCP features.

The matrix switcher will auto obtain an IP address, so you can scan the device directly by the control software.

Method B) When connecting VZ-MV1602-SDI with a PC without DHCP.

Please make sure that device and PC are in the same local area network, and set PC's IP address to "192.168.1.xxx", except device's default IP address 192.168.1.215, then press the "scanning" button on control software to scan the device. If the device cannot be found, wait 30s and then scan again.

PS: check the LAN port indicators to see current state of device.

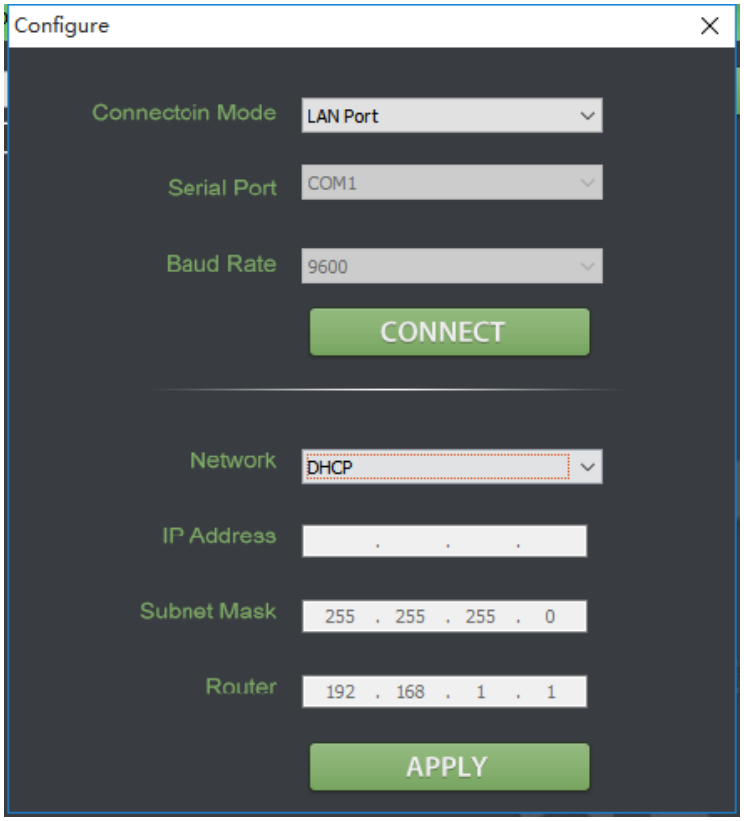
Yellow indicator blinking --- data is transmitting

Green indicator keeps on --- connect successfully with Ethernet

II. Seiral Port Control

1. Connecting device with a PC via serial port.

2. Press the SETTING



Menu Control

Main Menu	Sub Menu	Options	Description
System Setting	Language	Chinese/English	Change the Language between Chinese and English
	LCD brightness	10-100	Set the brightness backlight between 10-100
	LCD ON/OFF	Always/ Off/ Dim	Set the state of backlight,there are three mode for option: Always/Off/ Dim
	LCD Sleep	5~60s	Set backlight time of “Off” and “Dim”
	Reset		Reset to default configuration
	Custom1		Load Custom1 configuration
	Custom2		Load Custom2 configuration
	Return		Back to the main menu
Network Setting	IP Acqui	Dynamic/Static	Two ways to acquire the IP: Static(set IP freely by yourself) and Dynamic(IP configured by router)
	IP Addr		Set the IP address
	NetMask		Default setting is 255.255.255.0
	GateWay		Set Gateway according to current IP address
	Save		Save network setting
	Return		Back to the main menu
Overlay Setting	Item Select	UMD/Input Resolu/Audio Meter/Time Code/Border/Audio Alarm	Select a certain overlay
	Win/Source	1~16	Select a Window or signal source for each setting
	Enable	On/Off	On/Off the selected overlay
	Text Color	Yellow/White/Gray/Violet Red/Light Blue/Light Green/Light Cyan/Light Yellow/Transparent/HalfTrans/Black/Blue/Red/Magenta/Green/Cyan	Text color setting

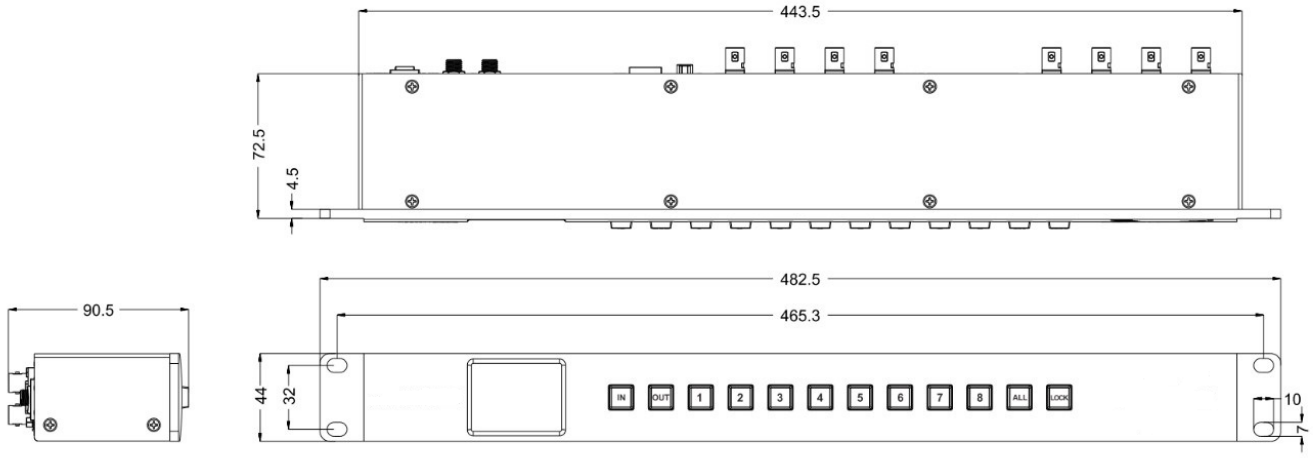
	Background	Yellow/White/Gray/Violet Red/Light Blue/Light Green/Light Cyan/Light Yellow/Transparent/HalfTrans/Black/Blue/Red/Magenta/Green/Cyan	Background color setting
	Return		Back to the main menu
Audio Setting	Audio Source	WIN1~WIN16	Select the audio source of multiviewer output
	Audio Meter	1~16	Select a certain window for audio meter setting
	Channel	CH1&CH2 CH3&CH4 CH5&CH6 CH7&CH8 CH9&CH10 CH11&CH12 CH13&CH14 CH15&CH16	Set the audio channel of audio meter
	Return		Back to the main menu
Output Setting	Format	1080P60/1080P50/1080P30/1080P25/1080P24/1080I60/1080I50/720P60/720P50	Set the output formats
	Mode	Multiviewer/Switcher	Change the mode between Multiviewer and Switcher
	SDI Loop Out		Under "Matrix Switcher" mode, set all input and output channels correspond one by one
	Return		Back to the main menu
Device Info	Version		Current version information
	Return		Back to the main menu
Exit			Exit main menu

Power

Power Supply	**Voltage Range**	**Power Consumption**
PS-1, PS-2, power redundancy	DC 12-24V	36W

Physical Specifications

Dimension	Net Weight	Gross Weight
Standard 19” 1 rack unit	2.0kg	3.8kg



Environmental Specifications

Operating Temperature	Storage Temperature	Relative Humidity
0℃~60℃	-30℃~70℃	0%~90% non-condensing

What's Included

Compact 1RU 16 Channel 3G-SDI Multiviewer with 16×16 3G-SDI Matrix Switcher

DC 12V 5A Power Adapter × 2

Warranty

3 Year Limited Manufacturer's Warranty.

✧ Note: due to constant effort to improve products and product features, specifications may change without notice.

16-CH SDI Multiviewer & Matrix Switcher API Guide

V1.1

Part 1 Communication Mode I

Interface: LAN

Communication Protocol: UDP Broadcast

Destination Port: 7000

Communication Mode II

Interface: RS-422

Baud Rate: 9600

Parity Bit: NONE

Data Bit: 8

Stop Bit: 1

Part 2 Format of Protocol Mode

2.1 Send from PC to Multiviewer

Data Packet	**Value (hex)**	**Byte**	**Description**
Packet Header	0xA5 0x6C	2	The beginning of data packet
Data Length	0x0000~0x0420	2	The length of the entire data packet from packet header to end (including header and end). The lower byte stays head.
Device Type	0x00~0xFF	1	Definition of device type, OXFF means broadcast.
Device ID	0x00~0xFF	1	A distinguishing of the device when there are several devices in a same LAN at same time. OXFF means broadcast.
Interface Type	0x00~0xFF	1	0x00:UART（serial port); 0x01: LAN
Reserve	0x00	9	For reserve.
Command	0x00~0xFF	1	Command for each function.
Packet Data	…….	Variable length	<= 1024
Checksum	0x0000~0xFFFF	2	The algebraic sum of all bytes from packet header to checksum (including the packet header and checksum). Take 2 bytes, other parts omitted. The lower byte stays ahead.
Packet End	0xAE	1	The end of the packet.

2.2 Return from Multiviewer to PC

Data Packet	Value (hex)	Byte	Description
Packet Header	0xA5 0x6C	2	The beginning of data packet.
Data Length	0x0000~0xFFFF	2	The length of the entire data packet from packet header to end (including the packet header and end). The lower byte stays ahead.
Device Type	0x00~ 0xFF	1	Definition of device type, OXFF means broadcast.
Device ID	0x00~0xFF	1	A distinguishing of the device when there are several devices in a same LAN at same time. OXFF means broadcast.
Interface Type	0x00~0xFF	1	0x00: UART (serial port); 0x01: LAN
Reserve	0x00	9	Reserve.
Command	0x00~0xFF	1	Command for each function.
Response Status	0x00 ~ 0xFF	1	0x00: Succeed; 0x01: Error; Other data undefined.
Response Content		Variable length	Reserve. The length of response content is variable when backward reading command, and it is consistent with the format of "packet data".
Checksum	0x0000~0xFFFF	2	The algebraic sum of all bytes from packet header to checksum (including the packet header and checksum). Take 2 bytes, other parts omitted. The lower byte stays ahead.
Packet End	0xAE	1	The end of the packet.

Note: Send = CMD + data; Return = CMD + status+data

Part 3 Device Type and Command

3.1 Device type: 0xa1

3.2 Command List

Function	Command (hex)	Description
Scanning	0xff	Broadcast to scan the multiviewer from the LAN.
Reading All the Data	0x0a	After device scanned, reading all status data of the device. Find out the device, read the status list of devices.
Output Layout	0x33	Change the output layouts. Value refers to Part 3.3.2 Output Layout List.
Output Resolution	0x19	Change the device output resolution. Value refers to Part 3.3.3 Output Resolution List.
UMD Overlay Enable	0x5c	Turn on/off the UMD overlay. 1: ON, 0: OFF
Audio Meter Enable	0x5b	Turn on/off the audio meter. 1: ON, 0: OFF

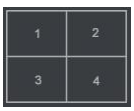
OSD Enable	0x5d	Turn on/off the OSD. 1: ON, 0: OFF	
Audio Alarm enable	0x56	Turn on/off the audio alarm function 1: ON, 0: OFF	
Time Code Enable	0x5e	Turn on/off time code 1: ON, 0: OFF	
Operating Mode	0x62	Change operating mode between Multiviewer and Switcher. 0： Multiviewer, 1: Switcher	
Matrix Switcher Input and Output Correspondence	0x5a	One to one correspondence between input and output under Matrix Switcher Mode. E.g.: input SDI1 by output SDI 1, input SDI2 by output SDI 2, …, and so forth.	
Select input source	0x34	Select the input sources for both Matrix Switcher and Multiviewer modes. Matrix Command format: cmd + input ch + output ch Multiviewer command format: cmd + input ch + win	
Set the UMD content for one channel	0x1e	Command format: cmd + ch + enable + xpos + ypos+ font + color + char Blue words as default. See the Examples Part 4.13.	
UMD enable for each channel	0x36	Command format: cmd + ch + enable (ON: 1, OFF: 0)	
Set the Audio source of Multiview output	0x39	0: OFF, 1-16: corresponding to the channel number	
Audio meter enable for One Window	0x37	Command format: cmd+ win + enable (ON: 1, OFF: 0)	
Select the Channel of Audio Meter for One Window	0x52	Command format: cmd + win + value (Value refer to Part 3.3.4 Audio Meter Channel List)	
Window border enable	0x3f	ON: 1, OFF: 0	
UMD text color	0x3b	Channels 0-16, 0: All channels, 1-16: corresponding to each channel	Color value refers to Part 3.3.5 Color value List
UMD background color	0x3c		
Resolution text color	0x3d		
Resolution background color	0x3e		
Time Code text color	0x54		
Time Code background color	0x55		
Factory reset	0x0b	Parameter always as 0x00	
Save the settings to Custom1 or Custom2	0x58	1: save to custom1/ load from custom1 2: save to custom2/ load from custom2	
Load Settings from Custom1 or Custom2	0x59		
Set the IP connecting mode	0x05	The 13th byte of the data bits. 0x01: dynamic IP (DHCP), 0x00: static IP	
Set Device Name	0x0f	Send the device name (max 16 character) by Unicode	

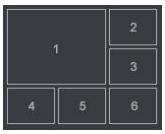
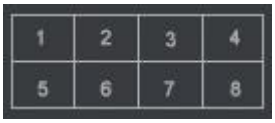
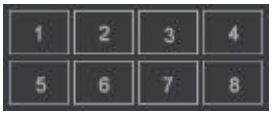
3.3 Partial Parameter List

3.3.1 The response Format of Reading All Data of the Device's Current Status

```
typedef struct
{
    unsigned char value:6;                  // output resolution
    unsigned char signal:1;                 //OSD enable 1 on, 0 off
    unsigned char res:1;                    //Reserved
}Reso_Byte;

typedef struct
{
    unsigned char uEn:1;
    unsigned char Color:4;
    unsigned char BGColor:5;
}Text_Dsip;

typedef struct
{
    unsigned char char_len;                 // UMD length
    unsigned char char_buf[34];             //UMD text
}Umd_String;

typedef struct
{
    unsigned char AudioBarEn:1;             //Audio meter in each window
    unsigned char AuidoDeCh:4;              // Audio de-embedding channel select
    Reso_Byte InReso;
// Read resolution from FPGA, the first 6bits means value being read,7bit means whether there is signal, 8bit is reversed.
    Text_Dsip InputInfo;                    //Input resolution color (OSD color)
    Text_Dsip TimeCode;                     //Time code color

    Text_Dsip AudioAlarm;                   //Audio alarm
}Osd_View_Cfg;

typedef struct
{
    unsigned char tWinMode;                 //Mode
    unsigned char tOutReso:4;               //Output resolution
    unsigned char tAudioOutNum:5;       //Choose audio from a certain window as the source for audio output
    //unsigned char tAuidoDeCh:4;           // Audio de-embedded channel
    unsigned char tCustom:2;                //Select custom mode

    unsigned char tAudioBarOnOff:1;         //Audio meter enable
    unsigned char tUmdOnOff:1;              //UMD enable

    unsigned char tInputInfoOnOff:1;        //OSD enable
    unsigned char tTimeCodeOnOff:1;         //Time code enable
    unsigned char tAudioAlarmOnOff:1;       //Audio alarm enable

    unsigned char tBorderOnOff:1;           //Border enable
    unsigned char tLockStatus:1;            //Front panel lock status

    unsigned char tDhcpStatus:1;            //DHCP status

    unsigned char tMatrixFlag:1;            //Matrix switcher mode
    unsigned char tMulti_InputBuf[16];      //Multiviewer input source
    unsigned char tMatrix_InputBuf[16];     //Matrix switcher input source

    Text_Dsip   tUmdDisp[16];               // UMD setting of 16 windows
    Osd_View_Cfg tView[16];     // OSD of 16 windows

}ST_Public_Data;

typedef struct
{
    ST_Public_Data stPub;   //Data synchronization between PC software and LCD display
    Umd_String stUmdStr[16];    //UMD string

    unsigned char ucDevNameLen;
    unsigned char ucDevName[32];
}ST_MultiView_Set;
```

3.3.2 Multiview Output Layout List

Layouts	Value (hex)	Note
	0x01	1-16 Corresponding to each channel, total 16 full screen layouts.
	0x02	
	0x03	
	0x04	
	0x05	
	0x06	
	0x07	
	0x08	
	0x09	
	0x0a	
	0x0b	
	0x0c	
	0x0d	
	0x0e	
	0x0f	
	0x10	
	0x28	Quad-split view Audio meter, UMD, OSD inside

	0x29	Quad-split view Audio meter, UMD, OSD outside
	0x2a	Quad-split view Audio meter, UMD, OSD outside, with analog clock
	0x3c	6 windows-1 Audio meter, UMD, OSD inside
	0x3d	6 windows-2 Audio meter, UMD, OSD outside
	0x50	8 windows-1 Audio meter, UMD, OSD inside
	0x51	8 windows-2 Audio meter, UMD, OSD outside
	0x52	8 windows-3 Digital clock in top center Audio meter, UMD, OSD outside
	0x53	8 windows-4 Digital clock in the middle Audio meter, UMD, OSD outside
	0x5a	9 windows-1 Audio meter, UMD, OSD inside
	0x5b	9 windows-2 Audio meter, UMD, OSD outside

	0x5c	9 windows-3 With analog clock, Audio meter, UMD, OSD outside Biggest window in the middle
	0x5d	9 windows-4 With analog clock Audio meter, UMD, OSD outside Biggest window in the upper left corner
	0x64	10 windows-1 Audio meter, UMD, OSD inside
	0x65	10 windows-2 Audio meter, UMD, OSD outside
	0x66	10 windows-3 Audio meter, UMD, OSD outside
	0x6f	11 windows-1 Audio meter, UMD, OSD outside, biggest window in the middle, with digital clock
	0x79	12 windows-1 Audio meter, UMD, OSD outside, with both analog and digital clock
	0xa0	16 windows-1 audio meter, UMD, OSD inside
	0xa1	16 windows-2 audio meter, UMD, OSD outside

3.3.3 Output Resolution List

Output Resolution	Value (hex)
1080p60	0x07
1080p50	0x0b
1080p30	0x03
1080p25	0x0d
1080p24	0x05
1080i60	0x09
1080i50	0x01
720p60	0x0e
720p50	0x06

3.3.4 Audio Meter Channel List

Channel Number	Value (hex)
CH 01&02	0x00
CH 03&04	0x01
CH 05&06	0x02
CH 07&08	0x03
CH 09&10	0x04
CH 11&12	0x05
CH 13&14	0x06
CH 15&16	0x07

3.3.5 Color Value List

Color	Value (hex)
Black	0x00
Blue	0x01
Red	0x02
Megenta	0x03
Green	0x04
Cyan	0x05
Yellow	0x06
White	0x07
Gray	0x08
VioletRed	0x09
LightBlue	0x0a
LightGreen	0x0b
LightCyan	0x0c
LightYellow	0x0d
Trans	0x0e
HalfTrans	0x0f

Part 4 Examples

Description: Following examples are through LAN port. Through serial port should change the interface byte and recalculate the Checksum. All data are hexadecimal. CMD in red color words, data in green words. Every packet data is in couple, including Send and Return.

Interface: LAN
Method: UDP Unicast
Destination Address: IP address of the multiviewer & matrix switcher
Destination Port: 7000

4.1 Locating the multiviewer & matrix switcher on the Network
Method: UDP Broadcast

Packet Format: a5 6c 14 00 81 ff 01 00 00 00 00 00 00 00 00 ff a5 03 ae
Destination Address: Broadcast 255.255.255.255
Destination Port: 7000
Return:
a5 6c 2c 00 a1 ff 01 00 00 00 00 00 00 00 00 ff 00 31 36 43 48 20 4d 75 6c 74 69 76 69 65 77
65 72 2d 0d 2d 43 04 26 35 95 0a ae

4.2 Read All Data of the Device's Current Status
Send:
a5 6c 14 00 a1 ff 01 00 00 00 00 00 00 00 00 0a d0 02 ae
Return:
a5 6c 09 03 a1 ff 01 00 00 00 00 00 00 00 00 0a 00 64 01 01 10 01 02 03 04 05 06 07 08 09 0a 0b 0c 0d 0e 0f 10
01 02 03 06 05 06 07 08 09 0a 0b 0c 0d 0e 0f 10 0d 0f 0d 0f 0d 0f 0d 0f 0d 0f 0d 0f 0d 0f 0d 0f 0d 0f 0d 0f 0d
0f 0d 0f 0d 0f 0d 0f 0d 0f 01 03 0d 0f 0d 0f 0f 02 01 03 0d 0f 0d 0f 0f 02 01 03 0d 0f 0d 0f 0f 02 01 03 0d 0f 0d 0f 0f
02 01 03 0d 0f 0d 0f 0f 02 01 03 0d 0f 0d 0f 0f 02 01 03 0d 0f 0d 0f 0f 02 01 03 0d 0f 0d 0f 0f 02 01 03 0d 0f 0d
0f 0f 02 01 03 0d 0f 0d 0f 0f 02 01 03 0d 0f 0d 0f 0f 02 01 03 0d 0f 0d 0f 0f 02 01 03 0d 0f 0d 0f 0f 02 01 03 0d
0f 0f 02 01 03 0d 0f 0d 0f 0f 02 01 03 0d 0f 0d 0f 0f 02 0c 53 00 44 00 49 00 20 00 30 00 31 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 0c 53 00 44 00 49 00 20 00 30 00 32 00 00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 0c 53 00 44 00 49 00 20 00 30 00 33 00 00 00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00 00 00 00 00 00 0c 53 00 44 00 49 00 20 00 30 00 34 00 00 00 00 00 00 00 00 00 00 00 00 00
00 00 00 0000 00 00 00 00 00 0c 53 00 44 00 49 00 20 00 30 00 35 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00 00 0c 53 00 44 00 49 00 20 00 30 00 36 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 0c 53 00 44 00 49 00 20 00 30 00 37 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00 00 00 00 0c 53 00 44 00 49 00 20 00 30 00 38 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00 00 0c 53 00 44 00 49 00 20 00 30 00 39 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0c 53 00 44 00 49 00 20 00 31 00 30 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 0c 53
00 44 00 49 00 20 00 31 00 31 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 0c 53 00 44
00 49 00 20 00 31 00 32 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 0c 53 00 44 00 49
00 20 00 31 00 33 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 0c 53 00 44 00 49 00 20
00 31 00 34 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 0c 53 00 44 00 49 00 20 00 31
00 35 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 0c 53 00 44 00 49 00 20 00 31 00 36
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 0c e3 21 ae

The Description of above Return:

a5 6c 09 03 a1 ff 01 00 00 00 00 00 00 00 00 00	From packet header to reserve
0a	Command byte
00	Response success
64	Output layout value
01	Definition of resolution, audio channel, and others overlay enables
01	
10	
01 02 03 04 05 06 07 08 09 0a 0b 0c 0d 0e 0f 10	Input channel under multiviewer mode (Total 16 channel)
01 02 03 06 05 06 07 08 09 0a 0b 0c 0d 0e 0f 10	Input channel under matrix switcher mode (Total 16 channel)
0d 0f	The information of UMD for 16 windows comes from structure Text Dsip.
0d 0f	
0d 0f	
0d 0f	
0d 0f	
0d 0f	
0d 0f	
0d 0f	
0d 0f	
0d 0f	
0d 0f	
0d 0f	
0d 0f	
0d 0f	
0d 0f	
0d 0f	
01 03 0d 0f 0d 0f 0f 02	Display information of 16 windows, including resolution, audio meter, OSD, time code, audio alarm.
01 03 0d 0f 0d 0f 0f 02	
01 03 0d 0f 0d 0f 0f 02	
01 03 0d 0f 0d 0f 0f 02	
01 03 0d 0f 0d 0f 0f 02	
01 03 0d 0f 0d 0f 0f 02	
01 03 0d 0f 0d 0f 0f 02	
01 03 0d 0f 0d 0f 0f 02	
01 03 0d 0f 0d 0f 0f 02	
01 00 0d 0f 0d 0f 0f 02	
01 03 0d 0f 0d 0f 0f 02	
01 03 0d 0f 0d 0f 0f 02	
01 03 0d 0f 0d 0f 0f 02	
01 03 0d 0f 0d 0f 0f 02	
01 03 0d 0f 0d 0f 0f 02	

01 00 0d 0f 0d 0f 0f 02		
0c	WIN 1 UMD length	UMD length and test of 16 windows, length occupies 1 byte, test occupied 34 bytes.
53 00 44 00 49 00 20 00 30 00 31 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	WIN 1 UMD text	
0c	WIN 2 UMD length	
53 00 44 00 49 00 20 00 30 00 32 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	WIN 2 UMD text	
0c	WIN 3 UMD length	
53 00 44 00 49 00 20 00 30 00 33 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	WIN 3 UMD text	
0c	WIN 4 UMD length	
53 00 44 00 49 00 20 00 30 00 34 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 0000 00 00 00 00 00	WIN 4 UMD text	
0c	WIN 5 UMD length	
53 00 44 00 49 00 20 00 30 00 35 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	WIN 5 UMD text	
0c	WIN 6 UMD length	
53 00 44 00 49 00 20 00 30 00 36 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	WIN 6 UMD text	
0c	WIN 7 UMD length	
53 00 44 00 49 00 20 00 30 00 37 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	WIN 7 UMD text	
0c	WIN 8 UMD length	
53 00 44 00 49 00 20 00 30 00 38 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	WIN 8 UMD text	
0c	WIN 9 UMD length	
53 00 44 00 49 00 20 00 30 00 39 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	WIN 9 UMD text	
0c	WIN 10 UMD length	
53 00 44 00 49 00 20 00 31 00 30 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	WIN 10 UMD text	
0c	WIN 11 UMD length	
53 00 44 00 49 00 20 00 31 00 31 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	WIN 11 UMD text	
0c	WIN 12 UMD length	
53 00 44 00 49 00 20 00 31 00 32 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	WIN 12 UMD text	
0c	WIN 13 UMD length	
53 00 44 00 49 00 20 00 31 00 33 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	WIN 13 UMD text	
0c	WIN 14 UMD length	

53 00 44 00 49 00 20 00 31 00 34 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	WIN 14 UMD text	
0c	WIN 15 UMD length	
53 00 44 00 49 00 20 00 31 00 35 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	WIN 15 UMD text	
0c	WIN 16 UMD length	
53 00 44 00 49 00 20 00 31 00 36 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	WIN 16 UMD text	
e3 21 ae	Checksum and packet end (2byte) + 0xae	

Note: The above information (starting from cmd, omit return value 0x00) uses the structure of ST Multiview Set from Part 3.1 to extract the data one by one accordingly.

4.3 Output Format Setting

E.g.: Setting the output resolution to 1080p50hz.

Send:

a5 6c 16 00 a1 ff 01 00 00 00 00 00 00 00 00 00 19 00 0b ec 02 ae

Return:

a5 6c 15 00 a1 ff 01 00 00 00 00 00 00 00 00 00 19 00 e0 02 ae

Note: In this command the first byte after 0x19 is always 0x00, and then the next byte is the resolution value.

4.4 UMD Enable

E.g.: Turn on UMD.

Send:

a5 6c 15 00 a1 ff 01 00 00 00 00 00 00 00 00 00 5c 01 24 03 ae

Return:

a5 6c 15 00 a1 ff 01 00 00 00 00 00 00 00 00 00 5c 00 23 03 ae

4.5 Audio Meter Enable

E.g.: Turn on audio meter.

Send:

a5 6c 15 00 a1 ff 01 00 00 00 00 00 00 00 00 00 5b 01 23 03 ae

Return:

a5 6c 15 00 a1 ff 01 00 00 00 00 00 00 00 00 00 5b 00 22 03 ae

4.6 OSD Enable

E.g.: Turn on OSD.

Send:

a5 6c 15 00 a1 ff 01 00 00 00 00 00 00 00 00 00 5d 01 25 03 ae

Return:

a5 6c 15 00 a1 ff 01 00 00 00 00 00 00 00 00 00 5d 00 24 03 ae

4.7 Audio Alarm Enable

E.g.: Turn on audio alarm.

Send:

a5 6c 15 00 a1 ff 01 00 00 00 00 00 00 00 00 00 56 01 1e 03 ae

Return:

a5 6c 15 00 a1 ff 01 00 00 00 00 00 00 00 00 00 56 00 1d 03 ae

4.8 Time Code Enable

E.g.: Turn on time code.

Send:

a5 6c 15 00 a1 ff 01 00 00 00 00 00 00 00 00 00 5e 01 26 03 ae

Return:

a5 6c 15 00 a1 ff 01 00 00 00 00 00 00 00 00 00 5e 00 25 03 ae

4.9 Switch between Multiviewer and Matrix Switcher Mode

E.g.: Switch to Multiviewer mode.

Send:

a5 6c 15 00 a1 ff 01 00 00 00 00 00 00 00 00 00 62 00 29 03 ae

Return:

a5 6c 15 00 a1 ff 01 00 00 00 00 00 00 00 00 00 62 00 29 03 ae

4.10 One to One Correspondence between Input and Output under Matrix Switcher Mode

Note: No parameter for this command.

Send:

a5 6c 14 00 a1 ff 01 00 00 00 00 00 00 00 00 00 5a 20 03 ae

Return:

a5 6c 15 00 a1 ff 01 00 00 00 00 00 00 00 00 00 5a 00 21 03 ae

4.11 Switching One Input to Output under Matrix Switcher Mode

E.g.: Switch input 15 to Output 8. Select “SDI 15” from the pull-down list of “OUTPUT 8”.

Send:

a5 6c 16 00 a1 ff 01 00 00 00 00 00 00 00 00 00 34 0f 08 13 03 ae

Return:

a5 6c 15 00 a1 ff 01 00 00 00 00 00 00 00 00 00 34 00 fb 02 ae

4.12 Switch Multiview Layout

E.g.: Switch the layout of Multiview output to 8 windows with digital clock in the top center.

Send:

a5 6c 15 00 a1 ff 01 00 00 00 00 00 00 00 00 00 33 52 4c 03 ae

Return:

a5 6c 15 00 a1 ff 01 00 00 00 00 00 00 00 00 00 33 00 fa 02 ae

4.13 Set UMD Content for One Channel

E.g.: Set the UMD content for Channel 1 to “SDI DD”.

Send:

a5 6c 28 00 a1 ff 01 00 00 00 00 00 00 00 00 00 1e 01 01 00 01 00 01 00 01 53 00 44 00 49 00 20 00 44 00 44 00 85 04 ae

Note:

01 01 Green words indicates the UMD enable of Channel 1 is ON.

The first 01 means the channel number, the second 01 means UMD ON (1) or OFF (0).

00 01 00 01 00 01 blue words are default.

53 00 44 00 49 00 20 00 44 00 44 00 yellow words indicate the actual text content “SDI DD”.

Return:

a5 6c 15 00 a1 ff 01 00 00 00 00 00 00 00 00 00 1e 00 e5 02 ae

4.14 Switch Audio Source of the Multiview output

E.g.: Set the audio source of Multiview coming from WIN8.

Send:

a5 6c 15 00 a1 ff 01 00 00 00 00 00 00 00 00 00 39 08 08 03 ae

Return:

a5 6c 15 00 a1 ff 01 00 00 00 00 00 00 00 00 00 39 00 00 03 ae

4.15 Audio Meter Enable for Windows

E.g.: Turn off the Window1’s audio meter overlay.

Send:

a5 6c 16 00 a1 ff 01 00 00 00 00 00 00 00 00 00 37 01 00 00 03 ae

Return:

a5 6c 15 00 a1 ff 01 00 00 00 00 00 00 00 00 00 37 00 fe 02 ae

4.16 Select the Channel of Audio Meter for Windows

E.g.: Select “CH 07&08” for Audio Meter in Window 3.

Send:

a5 6c 16 00 a1 ff 01 00 00 00 00 00 00 00 00 00 52 03 03 20 03 ae

Return:

a5 6c 15 00 a1 ff 01 00 00 00 00 00 00 00 00 00 52 00 19 03 ae

4.17 Set Text Color of UMD

E.g.: Set text color of UMD to Green for all Channels.

Send:

a5 6c 16 00 a1 ff 01 00 00 00 00 00 00 00 00 00 3b 00 04 07 03 ae

Return:

a5 6c 15 00 a1 ff 01 00 00 00 00 00 00 00 00 00 3b 00 02 03 ae

4.18 Set Background Color of UMD

E.g.: Set background color of UMD to Gray for Channel 5.

Send:

a5 6c 16 00 a1 ff 01 00 00 00 00 00 00 00 00 00 3c 05 08 11 03 ae

Return:

a5 6c 15 00 a1 ff 01 00 00 00 00 00 00 00 00 00 3c 00 03 03 ae

4.19 Set Text Color of OSD Resolution

E.g.: Set text color of OSD resolution to yellow for Window 7.

Send:

a5 6c 16 00 a1 ff 01 00 00 00 00 00 00 00 00 00 3d 07 06 12 03 ae

Return:

a5 6c 15 00 a1 ff 01 00 00 00 00 00 00 00 00 00 3d 00 04 03 ae

4.20 Set Background Color of OSD Resolution

E.g.: Set background color of OSD Resolution to Green for all windows.

Send:

a5 6c 16 00 a1 ff 01 00 00 00 00 00 00 00 00 00 3e 00 04 0a 03 ae

Return:

a5 6c 15 00 a1 ff 01 00 00 00 00 00 00 00 00 00 3e 00 05 03 ae

4.21 Set Text Color of Time Code

E.g.: Set text color of Time Code to Green for Window 1.

Send:

a5 6c 16 00 a1 ff 01 00 00 00 00 00 00 00 00 00 54 01 04 21 03 ae

Return:

a5 6c 15 00 a1 ff 01 00 00 00 00 00 00 00 00 00 54 00 1b 03 ae

4.22 Set Background Color of Time Code

E.g.: Set background color of Time Code to White for Window 1.

Send:

a5 6c 16 00 a1 ff 01 00 00 00 00 00 00 00 00 00 55 01 07 25 03 ae

Return:

a5 6c 15 00 a1 ff 01 00 00 00 00 00 00 00 00 00 55 00 1c 03 ae

4.23 Factory Reset

Note: This command has no return, the parameter value is always 0x00)

Send:

a5 6c 15 00 a1 ff 01 00 00 00 00 00 00 00 00 00 0b 00 d2 02 ae

4.24 Save Custom Settings

E.g.: Save custom settings to Custom 2

Send:

a5 6c 15 00 a1 ff 01 00 00 00 00 00 00 00 00 00 58 02 21 03 ae

Return:

a5 6c 15 00 a1 ff 01 00 00 00 00 00 00 00 00 00 58 00 1f 03 ae

4.25 Load Custom Settings

E.g.: Load settings from Custom 1

Send:

a5 6c 15 00 a1 ff 01 00 00 00 00 00 00 00 00 00 59 01 21 03 ae

Return:

a5 6c 15 00 a1 ff 01 00 00 00 00 00 00 00 00 00 59 00 20 03 ae

4.26 Set IP Address Setting Method

E.g.: Set IP setting method to Static IP connection, and set the IP address to 192.168.1.219

Send:

a5 6c 21 00 a1 ff 01 00 00 00 00 00 00 00 00 00 05 c0 a8 01 db ff ff ff 00 c0 a8 01 01 00 83 09 ae

Note:

Blue words indicate the current IP address, sub-net mask, default gateway.

Green words indicate the connection method.

0x00 means static IP, and blue words are the new IP information want to set.

0x01 means dynamic IP(DHCP), and blue words are meaningless.

Return:

a5 6c 15 00 a1 ff 01 00 00 00 00 00 00 00 00 00 05 00 cc 02 ae

4.27 Set Device Name

E.g.: Set device name to “Multiviewer”

Send:

a5 6c 28 00 a1 ff 01 00 00 00 00 00 00 00 00 00 0f 4d 00 75 00 6c 00 74 00 69 00 76 00 65 00 77 00 65 00 72 00 1d 07 ae

Note: Blue words indicate the name “Multiviewer”

Return:

a5 6c 15 00 a1 ff 01 00 00 00 00 00 00 00 00 00 0f 00 d6 02 ae