Marshall VSW-2200 Switcher Control Protocol

Firmware Version: 3.3
Document edited 8-22-2016
(legacy command structures have been removed from this document)

Serial Port (over USB) Setting:

Baud rate : 115200 bps
Data bit : 8 bits
Parity : None

Ethernet:

Strings are transmitted via TCP (not UDP)
To IP address + TCP Port.   The Port # is always 9760

Command String, Basic Structure:

Most commands will be either 4 or 5 bytes in length. The primary exception to this is a string that contains text such as labels for the Quad Split Preview windows. Labels can be up to 14 characters so a string could be up to 19 characters in length (5 byte command + 14 text characters).

Analyzing the command string for "switch to input #4"
05 90 00 03 98

05 String length. There are 5 bytes in this string so the first byte = 5
90 "The following is a Command"
00 Basic command category
03 Command value. In this case, inputs are numbered 0,1,2,3 so Input #4 is = 3
98 Simple check sum. This is the total of 5+90+0+3

Checksum detail:

Appended to the end of each command string is a Checksum Byte.
It is a simple sum of the previous bytes in the string starting with the byte representing the string length.
In cases where the Checksum value exceeds one byte, the most significant part is discarded.   For example, if the total of the previous bytes = Hex 126, the Checksum will be Hex 26.

Example code for the Checksum:
```
unsigned char Command[];
unsigned char length;
unsigned char Checksum;
unsigned char cnt;
Checksum=0;
for (cnt=0; cnt<length; cnt++)
{
Checksum += command[cnt];
}
return Checksum;
```

Command Acknowledgment

In almost all cases, issuing a command string to the switcher will result in the following two 3-byte acknowledgment strings: 03 81 84   03 82 85

These are not specific to the command that is sent, they are generic.

For more detailed feedback from the switcher, it is recommended to use the Get Device State command.

Special Note – Switcher Modes

The VSW-2200 switcher can be placed in two different operating modes.

Take Mode – In this mode, changing from one input to another requires that an explicit "take" command be issued after the new input is selected. On the unit itself, this is accomplished by pressing the Take button.   New switchers will be in Take Mode when shipped.

Immediate Mode – When the switcher is in Immediate mode, Take commands are not required and are ignored. The unit will switch to next input as soon as it is selected.

One the VSW-2200 unit, ***Take Mode*** can be toggled On or Off by pressing the Take button for 5 seconds or more.   Via software control, the ***Set Take Mode State*** command accomplishes the same thing. When the unit is in ***Immediate Mode***, the ***Switch Input Source*** command is all that is required to change select inputs. The Switcher Mode is retained after power on/off cycle.   For most reliable operation, it is suggested that the ***Take Mode*** be established during initialization of a controller.

Alternatively, the ***Switch Input Source*** command can be followed by the ***Program Out Take Command*** "just to make sure"....

VSW-2200 Protocol
Command Categories *(the 3rd byte specifies the category)*

	Category	Typical Hex Code String
Command		
	Category	Typical Hex Code String
Set Command		
1	Set System Control	05 90 04 00 99
2	Set Disabling Take	05 90 05 00 9a
3	Set Switching layout for Take channel	05 90 06 00 9b
4	Set Disabling Audio (Mute)	05 90 07 00 9c
5	Program Out – Take Input	04 90 01 95
6	Program Out – Picture Background Color	08 90 0e 00 00 00 00 a6
7	Program Out – Set Picture Control	05 90 09 d4 72
8	Program Out – Set Brightness	05 90 0f 00 a4
9	Program Out – Set Hue	05 90 10 00 a5
10	Program Out – Set Contrast	05 90 11 00 a6
11	Program Out – Set Saturation	05 90 12 00 a7
12	Program Out – Set Vertical Flip	05 90 13 00 a8
13	Program Out – Set Mirror	05 90 14 00 a9
14	Program Out – Set Horizontal Shift	05 90 15 00 aa
15	Program Out – Set Vertical Shift	05 90 16 00 ab
16	Quad View – Set Cross Layout	05 90 03 00 98
17	Quad View – Set Focus Top Layout	05 90 03 01 99
18	Quad View – Set Focus Bottom Layout	05 90 03 02 9a
19	Quad View – Set Cross Left Layout	05 90 03 03 9b
20	Quad View – Set Cross Right Layout	05 90 03 04 9c
21	Quad View – Set Label Text	1a 90 0d 00 05 10 11 12 13 14 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 16
22	Quad View – Set Label Position	06 90 0a 00 01 a1
23	Quad View – Set Border Enable	05 90 0b 01 a1
24	Quad View – Set Label Enable	05 90 0c 01 a2
25	Program Out – Set Output Resolution	05 90 17 00 ac
26	Quad View – Set Output Resolution	05 90 18 00 ad
26	Program Out – Switch Input	05 90 00 01 96
Get Command		
1	Get All Information	04 12 04 1a

Commands by Category

Set Take Mode State			
Function Description:			
Command (PC)			
Byte	Name	Value	Comment
0	Command Length	0x05	
1	Command	0x90	
2	Command	0x05	
3	Control Byte	0x00/0x01	0x00: Take Mode On 0x01: Take Mode Off
4	Check sum	0x9a	Example checksum
Command Acknowledgment			
0	ACK Length	0x03	
1	ACK	0x81	
2	ACK Check sum	0x84	
3	ACK Length	0x03	
4	ACK	0x82	
5	ACK Check sum	0x85	
Example String			
0x05 0x90 0x05 0x00 0x9a			

Set Switching Layout for Take channel (legacy command)			
Function Description:			
Command (PC)			
Byte	Name	Value	Comment
0	Command Length	0x05	
1	Command	0x90	
2	Command	0x06	
3	Control Byte	0x00	0x00: Disable 0x01: Enable
4	Check sum	0x9b	Example Checksum
Command Acknowledgment			
0	ACK Length	0x03	
1	ACK	0x81	
2	ACK Check sum	0x84	
3	ACK Length	0x03	
4	ACK	0x82	
5	ACK Check sum	0x85	
Example String			
0x05 0x90 0x06 0x00 0x9b			

Disable Audio Pass Through (Mute)

Function Description:

	Command (PC)		
Byte	Name	Value	Comment
0	Command Length	0x05	
1	Command	0x90	
2	Command	0x07	
3	Control Byte	0x00	0x00: Audio On 0x01: Audio Off (Mute)
4	Check sum	0x9c	Example Checksum
	Command Acknowledgment		
0	ACK Length	0x03	
1	ACK	0x81	
2	ACK Check sum	0x84	
3	ACK Length	0x03	
4	ACK	0x82	
5	ACK Check sum	0x85	
	Example String		
0x05 0x90 0x07 0x00 0x9c			

Switch Input Source

Function Description:

	Command (PC)		
Byte	Name	Value	Comment
0	Command Length	0x05	
1	Command	0x90	
2	Command	0x00	
3	Control Byte	0x01	0x00 ~ 0x03 = Input 1 ~ 4
4	Check sum	0x9c	Example Checksum
	Command Acknowledgment		
0	ACK Length	0x03	
1	ACK	0x81	
2	ACK Check sum	0x84	
3	ACK Length	0x03	
4	ACK	0x82	
5	ACK Check sum	0x85	
	Example String		
0x05 0x90 0x00 0x01 0x96			

Program Out – Take Input

Function Description:	*NOTE: Not required if switcher Take Mode = OFF*		

Command (PC)			
Byte	Name	Value	Comment
0	Command Length	0x04	
1	Command	0x90	
2	Command	0x01	
3	Check sum	0x95	Example Checksum

Command Acknowledgment			
0	ACK Length	0x03	
1	ACK	0x81	
2	ACK Check sum	0x84	
3	ACK Length	0x03	
4	ACK	0x82	
5	ACK Check sum	0x85	

Example String
0x04 0x90 0x01 0x95

Program Out – Picture Background Color

Function Description:	

Command (PC)			
Byte	Name	Value	Comment
0	Command Length	0x05	
1	Command	0x90	
2	Command	0x0e	
3	Picture Index	0x00	0x00~0x03: Picture Selection
4	Color Red	0x00	
5	Color Green	0x00	
6	Color Blue	0x00	
7	Check sum	0xa6	Example Checksum

Command Acknowledgment			
0	ACK Length	0x03	
1	ACK	0x81	
2	ACK Check sum	0x84	
3	ACK Length	0x03	
4	ACK	0x82	
5	ACK Check sum	0x85	

Example String
0x08 0x90 0x0e 0x00 0x00 0x00 0x00 0xa6

Program Out – Set Image Control

Function Description: Brightness, Contrast, Hue, Saturation, Vertical Flip, Mirror, Horizontal Shift, Vertical Shift			
Command (PC)			
Byte	Name	Value	Comment
0	Command Length	0x05	
1	Command	0x90	
2	Setting Type (function)	0x0f~0x16	0x0f: Brightness (Range: 0~255 Default:0x80)
3	Value (see ranges) Ranges are shown here in decimal form. The actual command requires Hexadecimal equivalent values. Defaults = mid-range values. For example: Decimal 128 = Hex 80 Decimal 100 = Hex 64 Decimal 50 = Hex 32	0x00	0x10: Hue (Range: 0~255 Default: 128) 0x11: Contrast (Range: 0~255 Default: 128) 0x12: Saturation (Range: 0~255 Default: 128) 0x13: Vertical Flip (Range: 0~1 Default: 0) 0x14: Mirror (Range: 0~1 Default: 0) 0x15: Horizontal Shift (Range: 0~200 Default:100) 0x16: Vertical Shift (Range: 0~100 Default: 50)
4	Check sum	0xa4	Example Checksum
Command Acknowledgment			
0	ACK Length	0x03	
1	ACK	0x81	
2	ACK Check sum	0x84	
3	ACK Length	0x03	
4	ACK	0x82	
5	ACK Check sum	0x85	
Example String			
0x05 0x90 0x0f 0x00 0xa4			

Quad View – Set Layout Mode

Function Description:
Cross, Focus Top, Focus Bottom, Focus Left, Focus Right
Focus = Border turns Red

Command (PC)			
Byte	Name	Value	Comment
0	Command Length	0x05	
1	Command	0x90	
2	Command	0x03	
3	Control Byte	0x00	0x00: Cross Layout 0x01: Focus Top Layout 0x02: Focus Bottom Layout 0x03: Focus Left Layout 0x04: Focus Right Layout
4	Check sum	0x98	Example Checksum
Command Acknowledgment			
0	ACK Length	0x03	
1	ACK	0x81	
2	ACK Check sum	0x84	
3	ACK Length	0x03	
4	ACK	0x82	
5	ACK Check sum	0x85	
Example String			
0x05 0x90 0x03 0x00 0x98			

Quad View – Set Label Text			
Function Description:			
Command (PC)			
Byte	Name	Value	Comment
0	Command Length	0x1a	
1	Command	0x90	
2	Command	0x0d	
3	Input Index	0x00	0x00~0x03: Input Channel
4	Text Length	0x05	0x01 ~ 0x14
5~24	Text Character	0x10	The font is referenced by Internal Font Image. The original design is standard ASCII Code which is without 0x00 to 0x1F. Example: The value 0x10 is '0'.
25	Check sum	0x16	Example Checksum
Command Acknowledgment			
0	ACK Length	0x03	
1	ACK	0x81	
2	ACK Check sum	0x84	
3	ACK Length	0x03	
4	ACK	0x82	
5	ACK Check sum	0x85	
Example String			
0x1a 0x90 0x0d 0x00 0x05 0x10 0x11 0x12 0x13 0x14 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x16			

Quad View – Set Label Position

Function Description:			

Command (PC)

Byte	Name	Value	Comment
0	Command Length	0x06	
1	Command	0x90	
2	Command	0x0a	
3	Input Index	0x00	
4	Label Position	0x01	0x00: Top-Left 0x01: Top-Middle 0x02: Top-Right 0x03: Bottom-Left 0x04: Bottom-Middle 0x05: Bottom-Right
5	Check sum	0xa1	Example Checksum

Command Acknowledgment

Byte	Name	Value	Comment
0	ACK Length	0x03	
1	ACK	0x81	
2	ACK Check sum	0x84	
3	ACK Length	0x03	
4	ACK	0x82	
5	ACK Check sum	0x85	

Example String

0x06 0x90 0x0a 0x00 0x01 0xa1

Quad View – Set Border On/Off

Function Description:			

Command (PC)

Byte	Name	Value	Comment
0	Command Length	0x05	
1	Command	0x90	
2	Command	0x0b	
3	Control Byte	0x00	0x00: Border On 0x01: Border Off
4	Check sum	0xa1	Example Checksum

Command Acknowledgment

0	ACK Length	0x03	
1	ACK	0x81	
2	ACK Check sum	0x84	
3	ACK Length	0x03	
4	ACK	0x82	
5	ACK Check sum	0x85	

Example String

0x05 0x90 0x0b 0x00 0xa1

Quad View – Set Label On/Off

Function Description:			

Command (PC)

Byte	Name	Value	Comment
0	Command Length	0x05	
1	Command	0x90	
2	Command	0x0c	
3	Control Byte	0x00	0x00: Label On 0x01: Label Off
4	Check sum	0xa1	Example Checksum

Command Acknowledgment

0	ACK Length	0x03	
1	ACK	0x81	
2	ACK Check sum	0x84	
3	ACK Length	0x03	
4	ACK	0x82	
5	ACK Check sum	0x85	

Example String

0x05 0x90 0x0b 0x00 0xa1

Program Out – Set Output Resolution

Function Description:			

	Command (PC)		
Byte	Name	Value	Comment
0	Command Length	0x05	
1	Command	0x90	
2	Command	0x17	
3	Control Byte	0x00	0x00: 1080P@60 0x01: 720P@60 0x11: 1080P@59.94 0x12: 1080P@50 0x13: 1080P@30 0x14: 1080P@29.97 0x15: 1080P@25 0x16: 1080P@23.98 0x17: 720P@59.94 0x18: 720P@50 0x19: 1080i@60 0x1a: 1080i@59.94 0x1b: 1080i@50
4	Check sum	0xac	Example Checksum
	Command Acknowledgment		
0	ACK Length	0x03	
1	ACK	0x81	
2	ACK Check sum	0x84	
3	ACK Length	0x03	
4	ACK	0x82	
5	ACK Check sum	0x85	
	Example String		
0x05 0x90 0x17 0x00 0xac			

Quad_view – Set Output Resolution

Function Description:			

Command (PC)

Byte	Name	Value	Comment
0	Command Length	0x05	
1	Command	0x90	
2	Command	0x18	
3	Control Byte	0x00	0x00: 1080P@60 0x01: 720P@60 0x11: 1080P@59.94 0x12: 1080P@50 0x13: 1080P@30 0x14: 1080P@29.97 0x15: 1080P@25 0x16: 1080P@23.98 0x17: 720P@59.94 0x18: 720P@50
4	Check sum	0xac	Example Checksum

Command Acknowledgment

Byte	Name	Value	Comment
0	ACK Length	0x03	
1	ACK	0x81	
2	ACK Check sum	0x84	
3	ACK Length	0x03	
4	ACK	0x82	
5	ACK Check sum	0x85	

Example String

0x05 0x90 0x18 0x00 0xad

Transition effect

Function Description: Seamless Cut, Fade, Dissolve modes Note: Fade-to-Black occurs when any source is selected twice and fades back up on the next source selection.			

Command (PC)

Byte	Name	Value	Comment
0	Command Length	0x05	
1	Command	0x90	
2	Command	0x19	
3	Control Byte	0x00	0x00: Fade 0x01: Seamless Cut 0x02:Dissolve
4	Check sum	0xae	Example Checksum

Command Acknowledgement

Byte	Name	Value	Comment
0	ACK Length	0x03	

1	ACK	0x81	
2	ACK Check sum	0x84	
3	ACK Length	0x03	
4	ACK	0x82	
5	ACK Check sum	0x85	
Example String			
0x05 0x90 0x19 0x00 0xae			

Set DHCP

Function Description: Note: Discovery via the Control Application is automatic when DHCP mode is enabled

Command (PC)			
Byte	Name	Value	Comment
0	Command Length	0x05	
1	Command	0x90	
2	Command	0x1A	
3	Control Byte	0x00	0x00: DHCP OFF 0x01: DHCP ON
4	Check sum	0xaf	Example Checksum
Command Acknowledgement			
0	ACK Length	0x03	
1	ACK	0x81	
2	ACK Check sum	0x84	
3	ACK Length	0x03	
4	ACK	0x82	
5	ACK Check sum	0x85	
Example String			
0x05 0x90 0x1A 0x00 0xaf			

Get Firmware Version

Function Description:

Command (PC)			
Byte	Name	Value	Comment
0	Command Length	0x04	
1	Command	0x12	
2	Command	0xf0	
3	Check sum	0x06	Example Checksum
Command Acknowledgment			
0	ACK Length	0x03	
1	ACK	0x81	
2	ACK Check sum	0x84	
3	Firmware Version Length		
4~X	FW Version Char		X depends on FW Version Length
X+1	ACK Length	0x03	

X+2	ACK	0x82	
X+3	ACK Check sum	0x85	
Example String			
0x04 0x12 0xf0 0x06			

Get Device State 1			
Function Description:			
Command (PC)			
Byte	Name	Value	Comment
0	Command Length	0x04	
1	Command	0x12	
2	Command	0x00	
3	Check sum	0x16	**Example Checksum**
Command Acknowledgment			
0	ACK Length	0x03	
1	ACK	0x81	
2	ACK Check sum	0x84	
3~258	Data		Refer to the tables below
259	ACK Length	0x03	
260	ACK	0x82	
261	ACK Check sum	0x85	
Example String			
0x04 0x12 0x00 0x16			

0x00~0x03	System Control	Taking Channel	Layout Mode (QV)	Control Picture (PO)
0x04~0x07	Output Resolution (PO)	Reserved	Border State	Label State
0x08~0x0b	Reserved	Picture 1 Width HB	Picture 1 Width LB	Picture 1 Height HB
0x0c~0x0f	Picture 1 Height LB	Picture 1 Color Red	Picture 1 Color Green	Picture 1 Color Blue
0x10~0x13	Reserved	Picture 2 Width HB	Picture 2 Width LB	Picture 2 Height HB
0x14~0x17	Picture 2 Height LB	Picture 2 Color Red	Picture 2 Color Green	Picture 2 Color Blue
0x18~0x1b	Reserved	Picture 3 Width HB	Picture 3 Width LB	Picture 3 Height HB
0x1c~0x1f	Picture 3 Height LB	Picture 3 Color Red	Picture 3 Color Green	Picture 3 Color Blue
0x20~0x23	Reserved	Picture 4 Width HB	Picture 4 Width LB	Picture 4 Height HB
0x24~0x27	Picture 4 Height LB	Picture 4 Color Red	Picture 4 Color Green	Picture 4 Color Blue
0x28~0x2b	Brightness (PO)	Contrast (PO)	Hue (PO)	Saturation (PO)
0x2c~0x2f	HFlip (PO)	VFlip (PO)	H Shift (PO)	V Shift (PO)

0x30~0x33	Label Position Input 1	Label Text Length Input 1	Label Position Input 2	Label Text Length Input 2
0x34~0x37	Label Position Input 3	Label Text Length Input 3	Label Position Input 4	Label Text Length Input 4
0x38~0x3b	Text 0 Input 1	Text 1 Input 1	Text 2 Input 1	Text 3 Input 1
0x3c~0x3f	Text 4 Input 1	Text 5 Input 1	Text 6 Input 1	Text 7 Input 1
0x40~0x43	Text 8 Input 1	Text 9 Input 1	Text 10 Input 1	Text 11 Input 1
0x44~0x47	Text 12 Input 1	Text 13 Input 1	Text 14 Input 1	Text 15 Input 1
0x48~0x4b	Text 16 Input 1	Text 17 Input 1	Text 18 Input 1	Text 19 Input 1
0x4c~0x4f	Text 0 Input 2	Text 1 Input 2	Text 2 Input 2	Text 3 Input 2
0x50~0x53	Text 4 Input 2	Text 5 Input 2	Text 6 Input 2	Text 7 Input 2
0x54~0x57	Text 8 Input 2	Text 9 Input 2	Text 10 Input 2	Text 11 Input 2
0x58~0x5b	Text 12 Input 2	Text 13 Input 2	Text 14 Input 2	Text 15 Input 2
0x5c~0x5f	Text 16 Input 2	Text 17 Input 2	Text 18 Input 2	Text 19 Input 2
0x60~0x63	Text 0 Input 3	Text 1 Input 3	Text 2 Input 3	Text 3 Input 3
0x64~0x67	Text 4 Input 3	Text 5 Input 3	Text 6 Input 3	Text 7 Input 3
0x68~0x6b	Text 8 Input 3	Text 9 Input 3	Text 10 Input 3	Text 11 Input 3
0x6c~0x6f	Text 12 Input 3	Text 13 Input 3	Text 14 Input 3	Text 15 Input 3
0x70~0x73	Text 16 Input 3	Text 17 Input 3	Text 18 Input 3	Text 19 Input 3
0x74~0x77	Text 0 Input 4	Text 1 Input 4	Text 2 Input 4	Text 3 Input 4
0x78~0x7b	Text 4 Input 4	Text 5 Input 4	Text 6 Input 4	Text 7 Input 4
0x7c~0x7f	Text 8 Input 4	Text 9 Input 4	Text 10 Input 4	Text 11 Input 4
0x80~0x83	Text 12 Input 4	Text 13 Input 4	Text 14 Input 4	Text 15 Input 4
0x84~0x87	Text 16 Input 4	Text 17 Input 4	Text 18 Input 4	Text 19 Input 4
0x88~0x8b	MAC_address[0]	MAC_address[1]	MAC_address[2]	MAC_address[3]
0x8c~0x8f	MAC_address[4]	MAC_address[5]	Reserved	Reserved
0x90~0x94	Reserved	Reserved	Reserved	Reserved

(QV) Quad View
(PO) Program Out