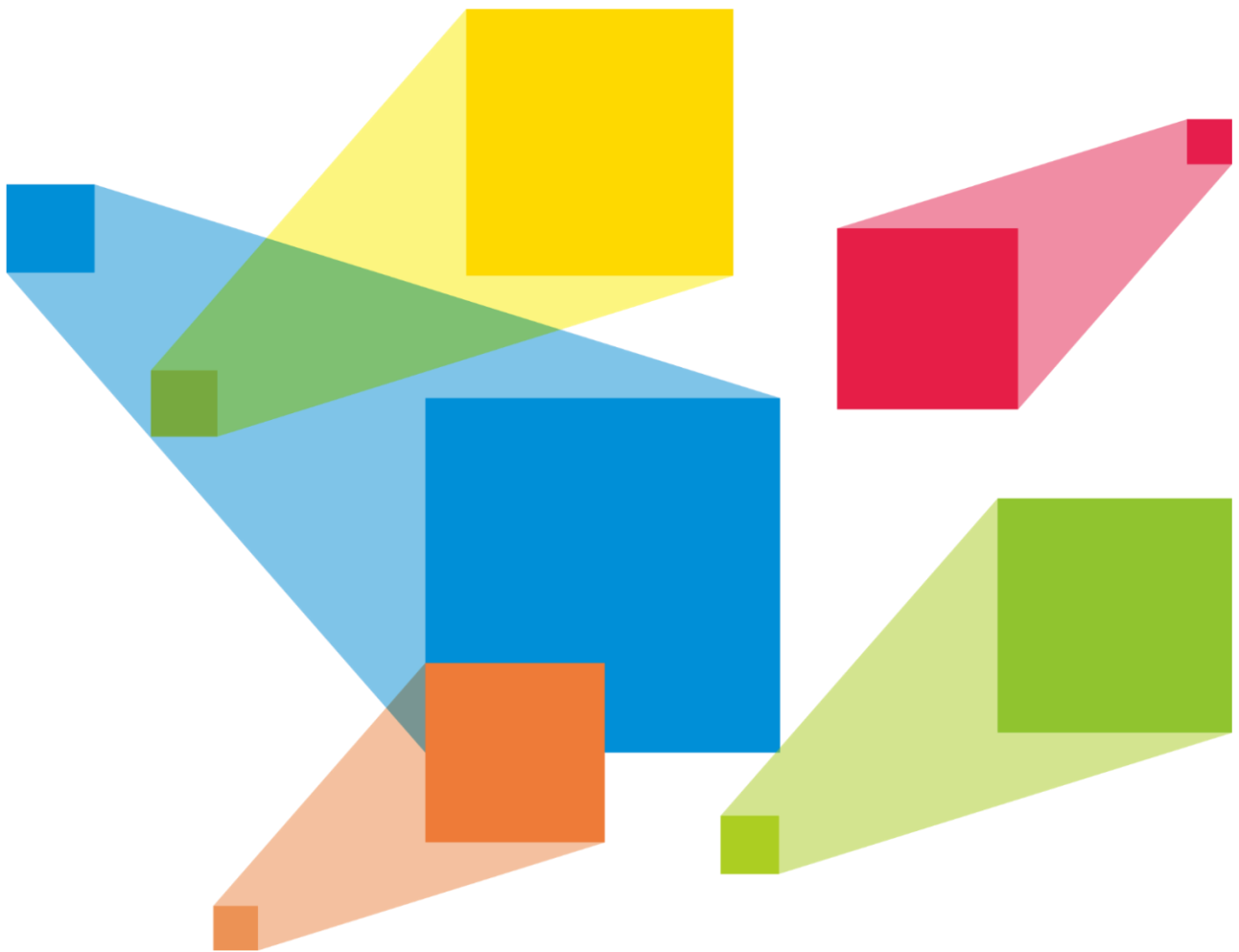


Multimedia Playback Software

Control Protocol



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1 Change History

Description	Version	Date
Added the function of retrieving layer list.	V2.1.1	2025-4-10
Added the function of enabling and disabling test pattern.		
Added the function of global play, pause and stop.		
Added the function of playing the previous or next program.	V2.1.2	2025-4-14
Added the function of pausing, playing, or stopping timeline.	V2.1.3	2025-5-27
Added the function of jumping to specified time on timeline.		
Added the function of playing media on a specific layer.	V2.5.0	2026-03-24
Added the function of jumping the timeline to a specific cue.		
• Added the function of connecting and disconnecting the output. • Added the function of shutting down and restart.	V2.6.0	2026-06-08
• Added the function of retrieving layer playback position (ms). • Added the function of adjusting layer playback position (ms).	V2.7.0	2026-06-25
Added the function of binding slice to layer.	V2.7.0	2026-06-26
Revised commands 4.5–4.8: Removed response definition as the protocol is now fire-and-forget (no reply frame).	V2.7.0	2026-07-22

2 Communication Method

The multimedia playback software implements the UDP and TCP communication methods. The online and offline services of the software only support the UDP communication method. For other services, the remote control terminal will establish communication with the software based on the actual situation.

The default port for UDP communication is 18959, which can be modified in the software.

The port for UDP data reporting is 18961 and cannot be modified.

The default port for TCP communication is 19958, which can be modified in the software.

Description of program ID in this protocol: Normally, the program ID starts from 0, which is displayed on the software interface from left to right. If you delete, add, copy or paste a program, the program ID sequence will be disordered. After you restart the software, the program ID will be rearranged from 0. (Under normal circumstances, the program ID of program 1 is 0, the program ID of program 2 is 1, and the program ID of program 3 is 2)

Description of program number in this protocol: The program number starts from 0, which is displayed on the software interface from left to right. If you delete, add, copy or paste a program, the program number will not change. (Under normal circumstances, the program number of program 1 is 0, the program number of program 2 is 1, and the program number of program 3 is 2)

Description of layer number in this protocol: The layer number starts from 0, which is displayed on the software interface from top to bottom. (Under normal circumstances, the layer number of layer 1 is 0, the layer number of layer 2 is 1, and the layer number of layer 3 is 2)

3 Frame Structure of Communication Protocol

The frame structure for the data packets related to discovery strategy and control strategy follows the following constraints. The frame structure adopts the little-endian mode, which means that the higher byte of the data is stored in the higher memory address, while the lower byte of the data is stored in the lower memory address.

Name		Size (Byte)	Default Value	Description
Head	Head	4	0x55CC55CC	The communication protocol between the central control device end and media server
	Packet Type	2		Reserved
	Protocol Version	2		The version number of the protocol For example, 0x0101 indicates version 1.1
	Sequence	2		The sequence number of the packet Increment by the sender and start over from 0 when it reaches the maximum.
	Content Length	2		The total length of the content
Content	Tag	2		The service type
	Length	2		The content length of the service data
	Value[]	N		The service data (length is N)

The TLV structure is used in the Content area in the above table. TLV refers to a structure composed of data type (Tag), data length (Length), and data value (Value), which can be used to describe almost any data type. TLV value can also be a TLV structure. It is precisely because of this nesting feature that we can realize the implementation of the protocol.

Note: If value involves a string array, the actual maximum length of valid data is the array length - 1, and the last digit is '\0'.

4 Service Content of Communication Interaction

4.1 Add Program

Function	Update Program				
Requester	Multimedia Playback Software		Request Method	UDP/TCP/Serial Port	
Request TLV	Name		Length	Default Value	Description
	Tag		2	5	
	Length		2		
	Value[]	ProgramCount[]	4		Total number of programs
		ProgramIndex[]	4		Program index (program's position in the program list), starting from 0
		ProgramId[]	4		Program ID, starting from 0
		ProgramName[]	128		Program name (UTF-8 encoding)
		IsEmpty[]	1		Indicates whether it is an empty program (0: empty, 1: non-empty)
Responder	None				
Example	Total number of programs: Program: 2 Program name: empty Program: non-empty CC 55 CC 55 01 00 00 01 02 00 11 00 05 00 0D 00 05 00 00 00 02 00 00 00 02 00 00 00 01				

4.2 Delete Single Program

Function	Delete Single Program				
Requester	Multimedia Playback Software		Request Method	UDP/TCP/Serial Port	
Request TLV	Name		Length	Default Value	Description
	Tag		2	6	
	Length		2		
	Value[]	ProgramId[]	4		Program ID, starting from 0
Responder	None				
Example	Delete program 3: CC 55 CC 55 01 00 00 01 02 00 08 00 06 00 04 00 02 00 00 00				

4.4 Retrieve Program List

Function	Retrieve Program List				
Requester	Central Control Device		Request Method	UDP/TCP/Serial Port	
Request TLV	Name		Length	Default Value	Description
	Tag		2	255	Can be omitted
	Length		2		
	Value[]	SoftName[]	64		Sender software name (UTF-8 encoding)
	Tag		2	129	
	Length		2		
	Value[]		0		
Example	CC 55 CC 55 01 00 00 01 02 00 04 00 81 00 00 00				
Responder	Multimedia Playback Software		Response Method	UDP/TCP/Serial Port	
Response TLV	Name		Length	Default Value	Description
	Tag		2	129	
	Length		2		
	Value[]	ProgramCount[]	4		Total number of programs
		ProgramIndex[]	4		Program ID index (relative to the total number), starting from 0
		ProgramId[]	4		Program ID, starting from 0
		ProgramName[]	128		Program name (UTF-8 encoding)
		IsEmpty[]	1		Indicates whether it is an empty program (0: empty, 1: non-empty)
Example	Total number of programs: 5 Program: 3 Program name: empty Program: non-empty CC 55 CC 55 01 00 00 01 02 00 11 00 81 00 0D 00 05 00 00 00 02 00 00 00 02 00 00 00 01				

4.5 Select Program

Function	Select Specified Program				
Requester	Central Control Device		Request Method	UDP/TCP/Serial Port	
Request TLV	Name		Length	Default Value	Description
	Tag		2	255	Can be omitted
	Length		2		
	Value[]	SoftName[]	64		Sender software name (UTF-8 encoding)
	Tag		2	130	
	Length		2		
	Value[]	ProgramId[]	4		Program ID, starting from 0
Example	Select program 4: CC 55 CC 55 01 00 00 01 02 00 08 00 82 00 04 00 03 00 00 00				
Responder	None				

4.6 Send Specified Program to Screen (Fade In and Fade Out)

Function	Send Specified Program to Screen (Fade In and Fade Out)				
Requester	Central Control Device		Request Method	UDP/TCP/Serial Port	
Request TLV	Name		Length	Default Value	Description
	Tag		2	255	Can be omitted
	Length		2		
	Value[]	SoftName[]	64		Sender software name (UTF-8 encoding)
	Tag		2	131	
	Length		2		
	Value[]	ProgramId[]	4		Program ID, starting from 0
Example	Fade in or fade out program 4: CC 55 CC 55 01 00 00 01 02 00 08 00 83 00 04 00 03 00 00 00				
Responder	None				

4.7 Send Specified Program to Screen (Cut)

Function	Send Specified Program to Screen (Cut)				
Requester	Central Control Device		Request Method	UDP/TCP/Serial Port	
Request TLV	Name		Length	Default Value	Description
	Tag		2	255	Can be omitted
	Length		2		
	Value[]	SoftName[]	64		Sender software name (UTF-8 encoding)
	Tag		2	132	
	Length		2		
	Value[]	ProgramId[]	4		Program ID, starting from 0
Example	Cut program 4: CC 55 CC 55 01 00 00 01 02 00 08 00 84 00 04 00 03 00 00 00				
Responder	None				

4.8 Pause Program

Function	Pause Specified Program				
Requester	Central Control Device		Request Method	UDP/TCP/Serial Port	
Request TLV	Name		Length	Default Value	Description
	Tag		2	133	
	Length		2		
	Value[]	ProgramId[]	4		Program ID, starting from 0
Example	Pause program 4: CC 55 CC 55 01 00 00 01 02 00 08 00 85 00 04 00 03 00 00 00				
Responder	None				

4.9 Enable FTB

Function	Enable FTB				
Requester	Central Control Device		Request Method	UDP/TCP/Serial Port	
Request TLV	Name		Length	Default Value	Description
	Tag		2	260	
	Length		2	0	
	Value[]	Data[]			
Responder	None				
Example	Enable FTB: CC 55 CC 55 01 00 00 01 02 00 04 00 04 01 00 00				

4.10 Disable FTB

Function	Disable FTB				
Requester	Central Control Device		Request Method	UDP/TCP/Serial Port	
Request TLV	Name		Length	Default Value	Description
	Tag		2	261	
	Length		2	0	
	Value[]	Data[]			
Responder	None				
Example	Disable FTB: CC 55 CC 55 01 00 00 01 02 00 04 00 05 01 00 00				

4.11 Enable Global Sound

Function	Enable Global Sound				
Requester	Central Control Device		Request Method	UDP/TCP/Serial Port	
Request TLV	Name		Length	Default Value	Description
	Tag		2	262	
	Length		2	0	
	Value[]	Data[]			
Responder	None				
Example	Enable global sound: CC 55 CC 55 01 00 00 01 02 00 04 00 06 01 00 00				

4.12 Disable Global Sound

Function	Disable Global Sound				
Requester	Central Control Device		Request Method	UDP/TCP/Serial Port	
Request TLV	Name		Length	Default Value	Description
	Tag		2	263	
	Length		2	0	
	Value[]	Data[]			
Responder	None				
Example	Disable global sound: CC 55 CC 55 01 00 00 01 02 00 04 00 07 01 00 00				

4.13 Adjust Global Volume

Function	Adjust Global Volume				
Requester	Central Control Device		Request Method	UDP/TCP/Serial Port	
Request TLV	Name		Length	Default Value	Description
	Tag		2	264	
	Length		2		
	Value[]	Volume[]	1		Volume value, ranging from 0 to 100
Responder	None				
Example	Set volume to 50: CC 55 CC 55 01 00 00 01 02 00 05 00 08 01 01 00 32				

4.14 Enable Layer Sound

Function	Enable Specified Layer Sound				
Requester	Central Control Device		Request Method	UDP/TCP/Serial Port	
Request TLV	Name		Length	Default Value	Description
	Tag		2	265	
	Length		2		
	Value[]	Layer[]	4		Layer index, starting from 0
Responder	None				
Example	Enable layer 2 sound: CC 55 CC 55 01 00 00 01 02 00 08 00 09 01 04 00 01 00 00 00				

4.15 Disable Layer Sound

Function	Disable Specified Layer Sound				
Requester	Central Control Device		Request Method	UDP/TCP/Serial Port	
Request TLV	Name		Length	Default Value	Description
	Tag		2	266	
	Length		2		
	Value[]	Layer[]	4		Layer index, starting from 0
Responder	None				
Example	Disable layer 2 sound: CC 55 CC 55 01 00 00 01 02 00 08 00 0A 01 04 00 01 00 00 00				

4.16 Increase Global Volume

Function	Increase Global Volume				
Requester	Central Control Device		Request Method	UDP/TCP/Serial Port	
Request TLV	Name		Length	Default Value	Description
	Tag		2	328	
	Length		2		
	Value[]	Volume[]	4		Volume (stepping: 1)
Responder	None				
Example	Increase global volume by 1: CC 55 CC 55 01 00 00 01 02 00 08 00 48 01 04 00 01 00 00				

4.17 Decrease Global Volume

Function	Decrease Global Volume				
Requester	Central Control Device		Request Method	UDP/TCP/Serial Port	
Request TLV	Name		Length	Default Value	Description
	Tag		2	329	
	Length		2		
	Value[]	Volume[]	4		Volume (stepping: 1)
Responder	None				
Example	Decrease global volume by 1: CC 55 CC 55 01 00 00 01 02 00 08 00 49 01 04 00 01 00 00				

4.18 Playback Control of PowerPoint or Other Media (Turn Pages) for Specified Layer

Function	Turn Pages for PowerPoint/Excel/PDF/Word/Media Collections				
Requester	Central Control Device		Request Method	UDP/TCP/Serial Port	
Request TLV	Name		Length	Default Value	Description
	Tag		2	364	
	Length		2		
	Value[]	LayerIndex	2		Layer index
		operationType	1		Operation types: 1. Previous page (supported media types: PowerPoint files, media collections) 2. Next page (supported media types: PowerPoint files, media collections)
Responder	None				
Example	Go to previous page of layer 3: cc 55 cc 55 01 00 00 01 02 00 07 00 6c 01 03 00 02 00 01				

4.19 Pause Program by Program Number

Function	Pause Specified Program				
Requester	Central Control Device		Request Method	UDP/TCP/Serial Port	
Request TLV	Name		Length	Default Value	Description
	Tag		2	365	
	Length		2		
	Value[]	Program[]	4		Program index, starting from 0
Responder	None				
Example	Pause program 8: CC 55 CC 55 01 00 00 01 02 00 08 00 6D 01 04 00 07 00 00 00				

4.20 Play Program by Program Number

Function	Play Specified Program				
Requester	Central Control Device		Request Method	UDP/TCP/Serial Port	
Request TLV	Name		Length	Default Value	Description
	Tag		2	366	
	Length		2		
	Value[]	Program[]	4		Program index, starting from 0
Responder	None				
Example	Play program 8: CC 55 CC 55 01 00 00 01 02 00 08 00 6E 01 04 00 07 00 00 00				

4.21 Stop Program by Program Number

Function	Stop Specified Program				
Requester	Central Control Device		Request Method	UDP/TCP/Serial Port	
Request TLV	Name		Length	Default Value	Description
	Tag		2	367	
	Length		2		
	Value[]	Program[]	4		Program index, starting from 0
Responder	None				
Example	Stop program 8: CC 55 CC 55 01 00 00 01 02 00 08 00 6F 01 04 00 07 00 00 00				

4.23 Retrieve Layer List

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4.24 Enable Test Pattern

Function	Enable Test Pattern				
Requester	Central Control Device		Request Method	UDP/TCP/Serial Port	
Request TLV	Name		Length	Default Value	Description
	Tag		2	258	
	Length		2	0	
	Value[]	Data[]			
Responder	None				
Example	Enable test pattern: CC 55 CC 55 01 00 00 01 02 00 04 00 02 01 00 00				

4.25 Disable Test pattern

Function	Disable Test pattern				
Requester	Central Control Device		Request Method	UDP/TCP/Serial Port	
Request TLV	Name		Length	Default Value	Description
	Tag		2	259	
	Length		2	0	
	Value[]	Data[]			
Responder	None				
Example	Disable test pattern: CC 55 CC 55 01 00 00 01 02 00 04 00 03 01 00 00				

4.26 Play Previous or Next Program

Function	Play Previous or Next Program				
Requester	Central Control Device		Request Method	UDP/TCP/Serial Port	
Request TLV	Name		Length	Default Value	Description
	Tag		2	388	
	Length		2		
	Value[]	state[]	1		0: Play previous program 1: Play next program
Responder	None				
Example	Play next program: CC 55 CC 55 01 00 00 01 02 00 05 00 84 01 01 00 01				

4.27 Pause, Play, or Stop Timeline

Function	Pause, Play, or Stop Timeline				
Requester	Central Control Device		Request Method	UDP/TCP/Serial Port	
Request TLV	Name		Length	Default Value	Description
	Tag		2	389	
	Length		2		
	Value[]	state[]	1		0: Pause timeline 1: Play timeline 2: Stop timeline 3: Play timeline from the beginning
Responder	None				
Example	Pause: CC 55 CC 55 01 00 00 01 02 00 05 00 85 01 01 00 00 Play: CC 55 CC 55 01 00 00 01 02 00 05 00 85 01 01 00 01				

4.28 Jump to Specified Time on Timeline

Function	Jump to Specified Time on Timeline				
Requester	Central Control Device		Request Method	UDP/TCP/Serial Port	
Request TLV	Name		Length	Default Value	Description
	Tag		2	390	
	Length		2		
	Value[]	state[]	4		Target time, in milliseconds
Responder	None				
Example	Jump to 00:10:00.000: CC 55 CC 55 01 00 00 01 02 00 08 00 86 01 04 00 C0 27 09 00 Jump to 00:00:06.000: CC 55 CC 55 01 00 00 01 02 00 08 00 86 01 04 00 70 17 00 00				

4.29 Play Media on Specific Layer

Function	Play Media on Specific Layer				
Requester	Central Control Device		Request Method	UDP/TCP/Serial Port	
Request TLV	Name		Length	Default Value	Description
	Tag		2	10004	
	Length		2		
	Value[]	CowIndex	2		Column (program index)
		RowIndex	2		Row (layer index)
Responder	None				
Example	Play media on Program 1 Layer 1: CC 55 CC 55 01 00 00 01 02 00 08 00 14 27 04 00 00 00 00 00				

4.30 Jump Timeline to Specific Cue

Function	Jump Timeline to Specific Cue				
Requester	Central Control Device		Request Method	UDP/TCP/Serial Port	
Request TLV	Name		Length	Default Value	Description
	Tag		2	10005	
	Length		2		
	Value[]	CueIndex	2		Timeline cue index, starting from 0
Responder	None				
Example	Jump timeline to the first cue: CC 55 CC 55 01 00 00 01 02 00 06 00 15 27 02 00 00 00				

4.31 Connect Output

Function	Connect Output				
Requester	Central Control Device		Request Method	UDP/TCP/Serial Port	
Request TLV	Name		Length	Default Value	Description
	Tag		2	256	
	Length		2	0	
	Value[]	Data[]			
Responder	None				
Example	Connect the output: CC 55 CC 55 01 00 00 01 02 00 04 00 00 01 00 00				

4.32 Disconnect Output

Function	Connect Output				
Requester	Central Control Device		Request Method	UDP/TCP/Serial Port	
Request TLV	Name		Length	Default Value	Description
	Tag		2	257	
	Length		2	0	
	Value[]	Data[]			
Responder	None				
Example	Disconnect the output: CC 55 CC 55 01 00 00 01 02 00 04 00 01 01 00 00				

4.33 Shut Down or Restart

Function	Shut Down or Restart				
Requester	Central Control Device		Request Method	UDP/TCP/Serial Port	
Request TLV	Name		Length	Default Value	Description
	Tag		2	24022	
	Length		2		
	Value[]	ShutdownMode	2		Shutdown mode 0: Shut down 1: Restart
Responder	None				
Example	Shut down: CC 55 CC 55 01 00 00 01 02 00 06 00 D6 5D 02 00 00 00 Restart: CC 55 CC 55 01 00 00 01 02 00 06 00 D6 5D 02 00 01 00				

4.34 Retrieve Layer Playback Position (ms)

Function	Retrieve Layer Playback Position (ms)				
Requester	Central Control Device		Request Method	UDP/TCP/Serial Port	
Request TLV	Name		Length	Default Value	Description
	Tag		2	10009	
	Length		2		
	Value[]	LayerIndex	2		Layer Index
Example	Retrieve for layer 1: CC 55 CC 55 01 00 00 01 02 00 06 00 19 27 02 00 00 00				
Responder	Multimedia Playback Software		Response Method	UDP/TCP/Serial Port	
Response TLV	Name		Length	Default Value	Description
	Tag		2	11003	
	Length		2		
	Value[]	Bsucceed	1		Execution result: 1: Successful 0: Failed
		LayerIndex	2		Layer index
		CurrentTime Ms	8		Played duration (ms)
		TotalTimeMs	8		Total media duration (ms)
		RemainTime Ms	8		Remaining playback time (ms)
Example	Retrieve layer playback position for layer 1: CC 55 CC 55 01 00 00 01 00 00 1F 00 FB 2A 1B 00 01 00 00 E4 30 00 00 00 00 00 30 75 00 00 00 00 00 4C 44 00 00 00 00 00				

4.35 Adjust Layer Playback Position (ms)

Function	Adjust Layer Playback Position (ms)				
Requester	Central Control Device		Request Method	UDP/TCP/Serial Port	
Request TLV	Name		Length	Default Value	Description
	Tag		2	10010	
	Length		2	0	
	Value[]	TriggerID[]	36		Initiator ID
		SeekPos	4		Target seek position (ms)
		Reserved	4		Reserved
		LayerIndex	2		Layer index
Example	Set layer 1 playback position to 5800 ms: CC 55 CC 55 00 00 01 01 E2 28 32 00 1A 27 2E 00 44 43 C3 64 14 C8 6C FA 00 A8 16 00 00 00 00 00 00 00 00				
Responder	Multimedia Playback Software		Response Method	UDP/TCP/Serial Port	
Response TLV	Name		Length	Default Value	Description
	Tag		2	10010	
	Length		2		
	Value[]	Bsucceed	1		Execution result: 1: Successful 0: Failed
		LayerIndex	2		Layer index
Example	Return success: CC 55 CC 55 01 00 00 01 00 00 07 00 1A 27 03 00 01 00 00				

4.36 Bind Slice to Layer

Function	Bind Slice to Layer				
Requester	Central Control Device		Request Method	UDP/TCP/Serial Port	
Request TLV	Name		Length	Default Value	Description
	Tag		2	10011	
	Length		2	0	
	Value[]	ProgramIndex	2		Program index, starting from 0
		OutputPatchLevel	2		Output slice level, starting from 1
		LayerIndex	2		Layer index, starting from 0
		Reserved	4		Reserved
Example	Bind layer 4 to output slice at level 2 in program 1: CC 55 CC 55 01 00 00 01 02 00 0E 00 1B 27 0A 00 00 00 02 00 03 00 00 00 00 00				
Responder	Multimedia Playback Software		Response Method	UDP/TCP/Serial Port	
Response TLV	Name		Length	Default Value	Description
	Tag		2	10011	
	Length		2		
	Value[]	Bsucceed	1		Execution result: 1: Successful 0: Failed
Example	Return success: CC 55 CC 55 01 00 00 01 02 00 05 00 1B 27 01 00 01				