Media Station RS-232/RS-485 Protocol Specification

Revision: 1.1

2017/12/22

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History

Version	Date	Comment
1.0	2017/12/19	1st release
1.1	2017/12/22	Remove get command: “Audio Mute”

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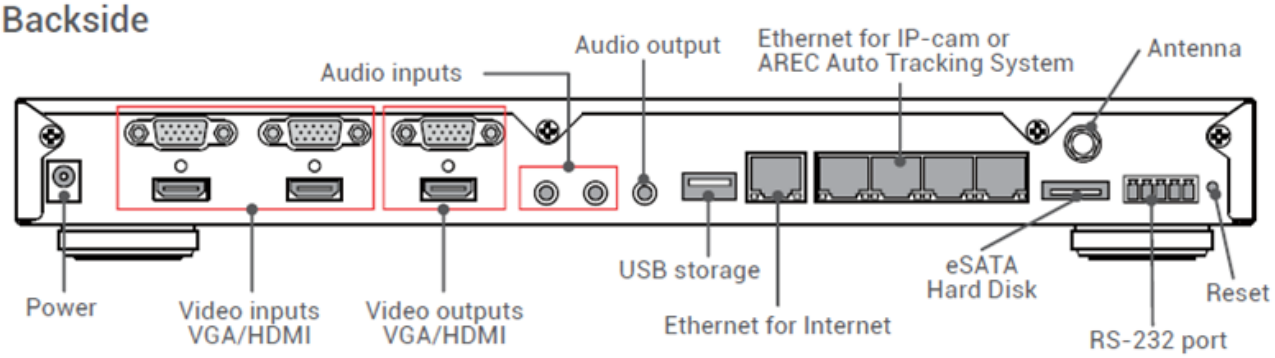
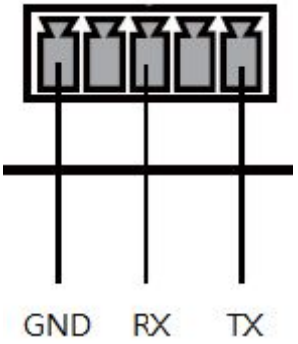
1 Interface

1.1 Hardware

■ Backside



Connect the RS-232 cable to the RS-232 port of the media station.
The pin definition of the RS-232 port：



GND：Ground
RX：Receive Data
TX：Transmit Data

1.2 Connection

Connect the GND, RX, TX pins of the RS-232 port with external control equipment. The media station will be controlled by RS-232 protocol. For example, use the standard 9 pin DB9 serial cable as follows：

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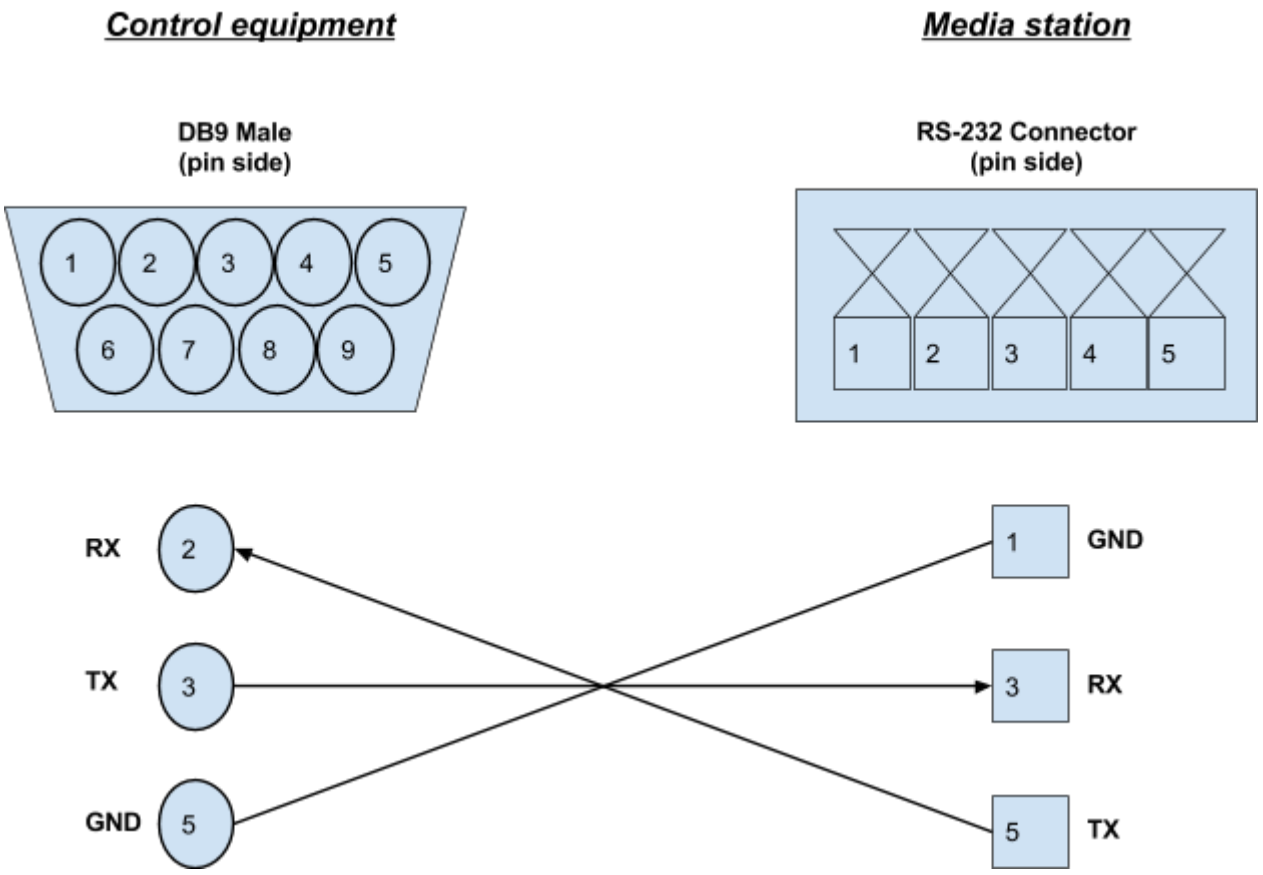

1.3 Configuration

- Baud rate ：9600
- Data length：8
- Parity：none
- Stop bit：1
- Flow control：none

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2 Control Protocol

2.1 Description

The media station can be controlled from an external controller through a serial RS-232 connection. Control protocol is used for the communication between the media station and controller.

2.2 Format

Name	Header	Extended Header	Length	Address	Action	Command	Parameters	Checksum	End
Byte count	1	1	1	1	1	2	n	1	1

- ***Header***
  0x55
  Protocol header.
- ***Extended header***
  0xff
  reserved for future use.
- ***Length***
  Length is a byte counter from **address to checksum** field.
  Example:

Name	Header	Extended Header	Length	Address	Action	Command	Parameters	Checksum	End
Hex	0x55	0xff	0x06	0x01	0x73	0x4c 0x4f	0x01	0x16	0x0d

Counter = address 1 byte+action 1 byte+command 2 bytes+parameter 1 byte+checksum 1 byte

Total length = 6 bytes

- ***Address***
  Identification of device. Range is 0x01 ~ 0xff.(0 is reserved)
  *Address is reserved for future use. Don't care
- ***Action***
  Get: 0x67
  "Query" operation for the media station.
  Set: 0x73
  "Set" operation for the media station.
  ACK: 0x06

When the media station receives the protocol data correctly and executes the correspond command successfully. It replaces the action field with ACK in the received protocol format and return to controller.

NAK: 0x15

When the media station receives the protocol data correctly but there are something wrong while the media station executes the correspond command.It replaces the action field with NAK in the received protocol format and return to controller.

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In addition, when the media station receives the invalid protocol data(ie. the protocol data that the media station can not understand). It returns NAK code and End code only.

- ***Command***
  Two bytes. Please refer to 2.3 Command Set and Parameters for more information.
- ***Parameters***
  Please refer to 2.3 Command Set and Parameters for more information.
- ***Checksum***
  Checksum is a byte sum.Add the data that from **length to parameters** field as unsigned binary numbers, discarding any overflow bits.
  Example:

Name	Header	Extended Header	Length	Address	Action	Command	Parameters	Checksum	End
Hex	0x55	0xff	0x06	0x01	0x73	0x4c 0x4f	0x01	0x16	0x0d

  Sum = 0x06+0x01+0x73+0x4c+0x4f+0x01 = 0x116
  Discarding overflow bits. Checksum = 0x16
- ***End***
  0x0d
  Protocol end code

2.3 Command Set and Parameters

"Set" Action Command List

Command	ASCII	Hex	Description
Power	PW	0x50 0x57	Power control
Record	RC	0x52 0x43	Record
Pause record	PS	0x50 0x53	Pause record
Stop record	SP	0x53 0x50	Stop record
Layout	LO	0x4c 0x4f	Layout control
Display	DP	0x44 0x50	Display control
Audio Volume	AV	0x41 0x56	Audio volume control
Audio Mute	AM	0x41 0x4d	Audio mute control

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Power

	ASCII	Hex	Description
Command code	PW	0x50 0x57	
Parameter 1	0 1	0x30 0x31	Power off Power on(NOT supported. Hardware limitation)

Record

	ASCII	Hex	Description
Command code	RC	0x52 0x43	Start record process
Parameter			

Pause

	ASCII	Hex	Description
Command code	PS	0x50 0x53	Pause record process
Parameter			

Stop

	ASCII	Hex	Description
Command code	SP	0x53 0x50	Stop record process
Parameter			

Layout

	ASCII	Hex	Description
Command code	LO	0x4c 0x4f	Set layout ID
Parameter 1		0x01~0xff	Layout ID

Display*

	ASCII	Hex	Description
Command code	DP	0x44 0x50	Set display ID
Parameter 1		0x01~0xff	Display ID

*Display command is not supported with display/record layout synchronization enabled

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Audio Volume

	ASCII	Hex	Description
Command code	AV	0x41 0x56	Set audio volume
Parameter 1	I O	0x49 0x4f	Set input volume Set output volume
Parameter 2	1 2 3 4 5	0x31 0x32 0x33 0x34 0x35	Input: HDMI1; Output: Line out/HDMI out Input: HDMI2; Output: None Input: JACK1; Output: None Input: JACK2; Output: None Input: BT MIC; Output: None
Parameter 3		0x00~0x7d 0x00~0x0f	Audio volume(0~50) BT MIC volume(0~15)

Audio Mute

	ASCII	Hex	Description
Command code	AM	0x41 0x4d	Set audio mute/unmute
Parameter 1	I O	0x49 0x4f	Set input mute/unmute Set output mute/unmute
Parameter 2	1 2 3 4 5	0x31 0x32 0x33 0x34 0x35	Input: HDMI1; Output: Line out/HDMI out Input: HDMI2; Output: None Input: JACK1; Output: None Input: JACK2; Output: None Input: BT MIC; Output: None
Parameter 3	0 1	0x30 0x31	Audio unmute Audio mute

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Example :

1. Record start

Controller send to Media station

Name	Header	Extended Header	Length	Address	Action	Command	Parameters	Checksum	End
Hex	0x55	0xff	0x05	0x01	0x73	0x52 0x43		0x0e	0x0d

Media station response to Controller

Success:

Name	Header	Extended Header	Length	Address	Action	Command	Parameters	Checksum	End
Hex	0x55	0xff	0x05	0x01	0x06	0x52 0x43		0xa1	0x0d

Failed:

Name	Header	Extended Header	Length	Address	Action	Command	Parameters	Checksum	End
Hex	0x55	0xff	0x05	0x01	0x15	0x52 0x43		0xb0	0x0d

2. Set layout ID 1

Controller send to Media station

Name	Header	Extended Header	Length	Address	Action	Command	Parameters	Checksum	End
Hex	0x55	0xff	0x06	0x01	0x73	0x4c 0x4f	0x01	0x16	0x0d

Media station response to Controller

Success:

Name	Header	Extended Header	Length	Address	Action	Command	Parameters	Checksum	End
Hex	0x55	0xff	0x06	0x01	0x06	0x4c 0x4f	0x01	0xa9	0x0d

Failed:

Name	Header	Extended Header	Length	Address	Action	Command	Parameters	Checksum	End
Hex	0x55	0xff	0x06	0x01	0x15	0x4c 0x4f	0x01	0xb8	0x0d

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"Get" Action Command List

Command	ASCII	Hex	Description
State	ST	0x53 0x54	System state
Layout	LO	0x4c 0x4f	Layout control
Display	DP	0x44 0x50	Display control
Audio Volume	AU	0x41 0x55	Audio volume control

State

	ASCII	Hex	Description
Command code	ST	0x53 0x54	Get system state
Response Parameter 1	0 1 2 3 4 5	0x30 0x31 0x32 0x33 0x34 0x35	Uninitialize Ready Stopped Streaming Paused Waiting

*Media station stay in "Waiting" state while web administrator and director login

Layout

	ASCII	Hex	Description
Command code	LO	0x4c 0x4f	Get layout ID
Response Parameter 1		0x01~0xff	Layout ID

Display*

	ASCII	Hex	Description
Command code	DP	0x44 0x50	Get display ID
Response Parameter 1		0x01~0xff	Display ID

*Display command is not supported with display/record layout synchronization enabled

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Audio Volume

	ASCII	Hex	Description
Command code	AV	0x41 0x56	Set audio volume
Command/Response Parameter 1	I O	0x49 0x4f	Set input volume Set output volume
Command/Response Parameter 2	1 2 3 4 5	0x31 0x32 0x33 0x34 0x35	Input: HDMI1; Output: Line out/HDMI out Input: HDMI2; Output: None Input: JACK1; Output: None Input: JACK2; Output: None Input: BT MIC; Output: None
Response Parameter 3		0x00~0x7d 0x00~0x0f	Audio volume(0~50) Bluetooth microphone volume(0~15)

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Example :

1. Get system state of media station

Controller send to Media station

Name	Header	Extended Header	Length	Address	Action	Command	Parameters	Checksum	End
Hex	0x55	0xff	0x05	0x01	0x67	0x53 0x54		0x14	0x0d

Media station response to Controller

Success: system state is Ready

Name	Header	Extended Header	Length	Address	Action	Command	Parameters	Checksum	End
Hex	0x55	0xff	0x06	0x01	0x06	0x53 0x54	0x31	0xe5	0x0d

Failed:

Name	Header	Extended Header	Length	Address	Action	Command	Parameters	Checksum	End
Hex	0x55	0xff	0x05	0x01	0x15	0x53 0x54		0xc2	0x0d

2. Get layout ID of media station

Controller send to Media station

Name	Header	Extended Header	Length	Address	Action	Command	Parameters	Checksum	End
Hex	0x55	0xff	0x05	0x01	0x67	0x4c 0x4f		0x08	0x0d

Media station response to Controller

Success: ID is 1

Name	Header	Extended Header	Length	Address	Action	Command	Parameters	Checksum	End
Hex	0x55	0xff	0x06	0x01	0x06	0x4c 0x4f	0x01	0xa9	0x0d

Failed:

Name	Header	Extended Header	Length	Address	Action	Command	Parameters	Checksum	End
Hex	0x55	0xff	0x05	0x01	0x15	0x4c 0x4f		0xb6	0x0d

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3 RC pass-through Protocol

3.1 Description

Remote control pass-through protocol is used for an external device that want to simulate as an infrared remote controller. The operation transition with RC data field of the protocol is the same as from the infrared remote controller.

3.2 Format

Command

Name	Header	Length	RC Data	End
Byte count	1	1	n	1

- ***Header***
  0x36
  Remote control pass-through protocol
- ***Length***
  Length is a byte counter in RC data field.
- ***RC Data***
  RC code. Please refer to 3.3 RC code for more information.
- ***End***
  0x0d
  End code of command.

Response

Name	ACK/NAK	End
Byte count	1	1

- ***ACK***
  0x06
  The command is accepted in the media station.
- ***NAK***
  0x15
  The command is not accepted in the media station.
- ***End***
  0x0d
  End code of response.

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3.3 RC code

The RC codes in the data field will be passed to media station such as an infrared remote controller send.The byte counts of the RC data field must record in length field. There is 1 second latency between two RC codes passed to media station.

The RC codes list as below:

RC code	Function
0x0a	Power
0x25	Aspect ratio
0x22	A
0x3f	B
0x20	C
0x24	D
0x28	0
0x2a	1
0x2b	2
0x2c	3
0x36	4
0x1d	5
0x34	6
0x3c	7
0x0b	8
0x0f	9
0x1a	Record start
0x18	Snapshot
0x19	Menu
0x38	Home
0x00	Preview layout
0x08	Up
0x07	Left

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0x06	Right
0x09	Down
0x1c	OK
0x0c	Exit
0x0e	Zoom
0x03	Volume up
0x02	Volume down
0x1b	Channel up
0x0d	Channel down
0x4c	Mute
0x11	Information
0x16	Record layout
0x14	Play
0x17	Pause
0x1f	Playback/Record stop
0x13	Last course
0x15	Next course
0x10	Last knowledge mark
0x12	Next knowledge mark
0x2d	Camera P1
0x05	Camera P2
0x3a	Camera P3
0x29	Camera P0
0x30	Camera patrol
0x3e	Camera zoom in
0x2e	Camera zoom out
0x40	Display layout 1
0x41	Display layout 2

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0x42	Display layout 3
0x43	Display layout 4
0x44	Display layout 5
0x45	Display layout 6
0x46	Display layout 7
0x47	Display layout 8
0x48	Display layout 9

Example：

1. Snapshot：

Controller send to Media station

Name	Header	Length	RC Data	End
Hex	0x36	0x01	0x18	0x0d

Media station response ACK to Controller

Name	ACK/NAK	End
Hex	0x06	0x0d

2. Start record(skip snapshot dialog after “start record” received)：

Controller send to Media station

Name	Command Type	Length	RC Data 1	RC Data 2	End
Hex	0x36	0x02	0x1a	0x1a	0x0d

Media station response ACK to Controller

Name	ACK/NAK	End
Hex	0x06	0x0d

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4 Note

1. Commands are not accepted during media station boot-up.

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