



# Media Station RS-232/TCP Protocol Specification

Revision: 2.0

2021/08/19

## About This Document

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### Related Versions

The following table lists the product versions related to this document.

Product Name	Version
DS-X01	v9.0.10

# Contents

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**3 Note**

3.1

3.2 Format ( Enable Checksum )

# Tables

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[Table 2-1 Format](#)

# History

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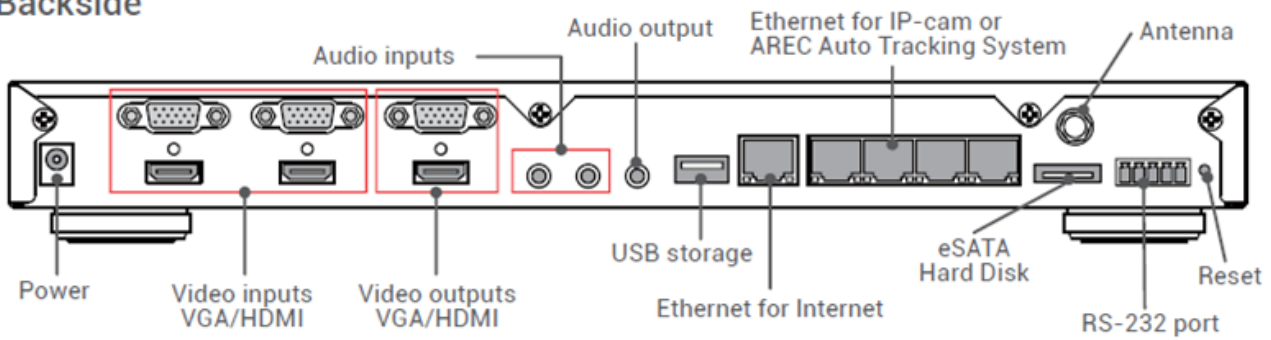
Version	Date	FW ver.	Comment
1.1 5.3	2019/10/30 2021/07/09	9.0.0.x 2.10.x.27	Inherit from DS-X01 v1.1 file and common series v5.3 file
2.0	2021/08/19	9.0.10.5	For DS-X01 v2.0 file release <ul style="list-style-type: none"> <li>● New               <ul style="list-style-type: none"> <li>○ 2.3.5 Cmd System &amp; Others                   <ul style="list-style-type: none"> <li>■ 2.3.5.1 Get Model Name</li> <li>■ 2.3.5.1 Get Network Configuration</li> </ul> </li> <li>○ 3.2 Format ( Enable Checksum )</li> </ul> </li> <li>● Modify               <ul style="list-style-type: none"> <li>○ 2.2 Format                   <ul style="list-style-type: none"> <li>■ remove checksum</li> </ul> </li> <li>○ 2.3.3 Cmd Audio Vol</li> <li>○ 2.3.4 Cmd Audio Mute                   <ul style="list-style-type: none"> <li>■ Input remove 0x33 “BT MIC”</li> <li>■ Input add 0x33 “Audio in 1/2 ( Line-in &amp; Mic-in )”</li> <li>■ Input add 0x34 “IP Audio”</li> </ul> </li> </ul> </li> </ul>

# 1 Interface

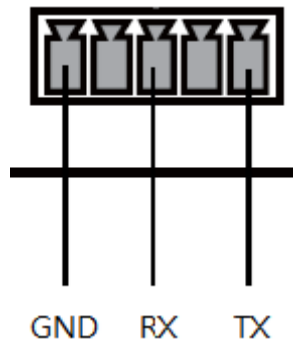
## 1.1 Hardware

### 1.1.1 RS-232

#### ■ 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

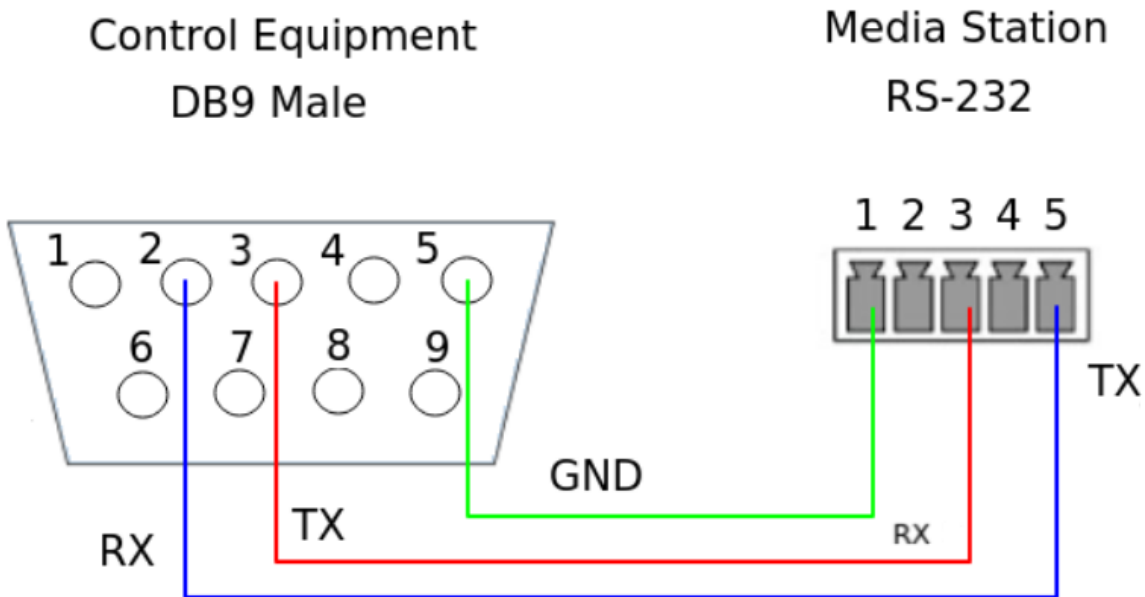
### 1.1.2 TCP

Connect the CAT-5 (or greater) cable to WAN (or LAN) RJ-45 port of Media Station.

## 1.2 Connection

### 1.2.1 RS-232

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:



### 1.2.2 TCP

Connect the Media Station's WAN port (or LAN port) and an external control equipment's ethernet port with a CAT-5 (or greater) cable.

## 1.3 Configuration

### 1.3.1 RS-232

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

### 1.3.2 TCP

- IP address : Media Station's WAN IP address / Media Station's LAN IP address (static IP address: 192.168.11.254)
- Port : 5080



## 2 Control Protocol

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### 2.1 Description

- **RS-232**  
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.
- **TCP**  
When an external controller connects Media Station through network connection, the Media Station can be controlled by a command described in Control Protocol. If the connection is not closed by the client, the connection will keep until a new connection is established.
- **Cmd Execution**  
When the remote controller sends a command which is a “set” type request to the media station. After the transmission, the remote controller must wait for the response coming from the media station.

### 2.2 Format

Table 2-1 Format

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

- **Header**  
**0x55** : Protocol header.
- **Extended header**  
**0xF0** : disable checksum  
**0xFF** : enable checksum, please reference to [3.2](#)
- **Length**  
Length is a byte counter from **address to Parameters** field.

Example:

Name	Header	Extended Header	Length	Address	Action	Cmd	Parameters	End
Hex	0x55	0xF0	0x05	0x01	0x73	0x4C 0x4F	0x01	0x0D

Total length = address 1 byte+action 1 byte+command 2 bytes+parameter 1 byte = 5 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 corresponding command successfully. It replaces the action field with ACK in the received protocol format and returns to the controller.

**NAK: 0x15**  
 When the media station receives the protocol data correctly but there is something wrong while the media station executes the corresponding command.It replaces the action field with NAK in the received protocol format and returns to the controller.  
 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.

- **Cmd**  
 Two bytes. Please refer to 2.3 Cmd Set and Parameters for more information.
- **Parameters**  
 Please refer to 2.3 Cmd Set and Parameters for more information.
- **End**  
**0x0d**  
 Protocol end code

## 2.3 Cmd & Example

Change video compression or streaming settings or any action that will restart the media function, system will send event notification including state, layout, background, overlay, display layout.

### 2.3.1 Cmd Power

#### 2.3.1.1 Set Power

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

**Example**

Name	Header	Extended Header	Length	Address	Action	Cmd	Parameters	End
SET	0x55	0xF0	0x05	0x01	0x73	0x50 0x57	0x30	0x0D
ACK					0x06			
FAILED					0x15			

## 2.3.2 Cmd Channel

### 2.3.2.1 Set Channel

	ASCII	Hex	Description
Command code	CH	0x43 0x48	Set Channel ID
Parameter 1	1 2	0x31 0x32	Set channel type source Set channel type stream
Parameter 2		0x00~0xff	Channel ID

**Example**

Name	Header	Extended Header	Length	Address	Action	Cmd	Parameters	End
SET	0x55	0xF0	0x06	0x01	0x73	0x43 0x48	0x31 0x01	0x0D
ACK					0x06			
FAILED					0x15			

## 2.3.3 Cmd Audio Vol

### 2.3.3.1 Set Audio Vol Input

	ASCII	Hex	Description
Cmd code	AV	0x41 0x56	Set audio volume
Parameter 1	I	0x49	Set input volume
Parameter 2	1	0x31	HDMI 1

	2	0x32	HDMI 2
	3	0x33	Audio in 1/2 ( Line-in & Mic-in )
	4	0x34	IP Audio
Parameter 3		0x00~0x7D	Audio volume(0~125)

**Example**

Name	Header	Extended Header	Length	Address	Action	Cmd	Parameters	End
SET	0x55	0xF0	0x07	0x01	0x73	0x41 0x56	0x49 0x31 0x00	0x0D
ACK					0x06			
FAILED					0x15			

**2.3.3.2 Set Audio Vol Output**

	ASCII	Hex	Description
Cmd code	AV	0x41 0x56	Set audio volume
Parameter 1	O	0x4F	Set output volume
Parameter 2	1 2	0x31 0x32	Line out HDMI out
Parameter 3		0x00~0x7D	Audio volume(0~125))

**Example**

Name	Header	Extended Header	Length	Address	Action	Cmd	Parameters	End
SET	0x55	0xF0	0x07	0x01	0x73	0x41 0x56	0x4F 0x31 0x00	0x0D
ACK					0x06			
FAILED					0x15			

**2.3.3.3 Get Audio Vol Input**

	ASCII	Hex	Description
Cmd code	AV	0x41 0x56	Get audio volume
Cmd/Rsp Parameter 1	I	0x49	Get input volume
Cmd/Rsp Parameter 2	1 2 3	0x31 0x32 0x33	HDMI 1 HDMI 2 Audio in 1/2 ( Line-in & Mic-in )

	4	0x34	IP Audio
Rsp Parameter 3		0x00~0x7D	Audio volume(0~125)

**Example**

Name	Header	Extended Header	Length	Address	Action	Cmd	Parameters	End
GET	0x55	0xF0	0x06	0x01	0x67	0x41 0x56	0x49 0x31	0x0D
ACK			0x07		0x06		0x49 0x31 0x00	
FAILED			0x06		0x15		0x49 0x31	

**2.3.3.4 Get Audio Vol Output**

	ASCII	Hex	Description
Cmd code	AV	0x41 0x56	Get audio volume
Cmd/Rsp Parameter 1	O	0x4F	Get output volume
Cmd/Rsp Parameter 2	1 2	0x31 0x32	Line out HDMI out
Rsp Parameter 3		0x00~0x7D	Audio volume(0~125)

**Example**

Name	Header	Extended Header	Length	Address	Action	Cmd	Parameters	End
GET	0x55	0xF0	0x06	0x01	0x67	0x41 0x56	0x4F 0x31	0x0D
ACK			0x07		0x06		0x4F 0x31 0x00	
FAILED			0x06		0x15		0x4F 0x31	

**2.3.4 Cmd Audio Mute**

**2.3.4.1 Set Audio Mute Input**

	ASCII	Hex	Description
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Cmd code	AM	0x41 0x4D	Set audio mute/unmute
Parameter 1	I	0x49	Set input mute/unmute
Parameter 2	1 2 3 4	0x31 0x32 0x33 0x34	HDMI 1 HDMI 2 Audio in 1/2 ( Line-in & Mic-in ) IP Audio
Parameter 3	0 1	0x30 0x31	Audio unmute Audio mute

**Example**

Name	Header	Extended Header	Length	Address	Action	Cmd	Parameters	End
SET	0x55	0xF0	0x07	0x01	0x73	0x41 0x4D	0x49 0x31 0x30	0x0D
ACK					0x06			
FAILED					0x15			

**2.3.4.2 Set Audio Mute Output**

	ASCII	Hex	Description
Cmd code	AM	0x41 0x4D	Set audio mute/unmute
Parameter 1	O	0x4F	Set output mute/unmute
Parameter 2	1 2	0x31 0x32	Line out HDMI out
Parameter 3	0 1	0x30 0x31	Audio unmute Audio mute

**Example**

Name	Header	Extended Header	Length	Address	Action	Cmd	Parameters	End
SET	0x55	0xF0	0x07	0x01	0x73	0x41 0x4D	0x4F 0x31 0x30	0x0D
ACK					0x06			
FAILED					0x15			

**2.3.4.3 Get Audio Mute Input**

	ASCII	Hex	Description
Cmd code	AM	0x41 0x4D	Get audio mute/unmute

Cmd/Rsp Parameter 1	1	0x49	Get input mute/unmute
Cmd/Rsp Parameter 2	1 2 3 4	0x31 0x32 0x33 0x34	HDMI 1 HDMI 2 Audio in 1/2 ( Line-in & Mic-in ) IP Audio
Rsp Parameter 3	0 1	0x30 0x31	Audio unmute Audio mute

**Example**

Name	Header	Extended Header	Length	Address	Action	Cmd	Parameters	End
GET	0x55	0xF0	0x06	0x01	0x67	0x41 0x4D	0x49 0x31	0x0D
ACK			0x07		0x06		0x49 0x31 0x30	
FAILED			0x06		0x15		0x49 0x31	

**2.3.4.4 Get Audio Mute Output**

	ASCII	Hex	Description
Cmd code	AM	0x41 0x4D	Get audio mute/unmute
Cmd/Rsp Parameter 1	O	0x4F	Get output mute/unmute
Cmd/Rsp Parameter 2	1 2	0x31 0x32	Line out HDMI out
Rsp Parameter 3	0 1	0x30 0x31	Audio unmute Audio mute

**Example**

Name	Header	Extended Header	Length	Address	Action	Cmd	Parameters	End
GET	0x55	0xF0	0x06	0x01	0x67	0x41 0x4D	0x4F 0x31	0x0D
ACK			0x07		0x06		0x4F 0x31 0x30	
FAILED			0x06		0x15		0x4F 0x31	

**2.3.5 Cmd System & Others**

### 2.3.5.1 Get Model Name

	ASCII	Hex	Description
Cmd code	GM	0x47 0x4D	Get model name

#### Example

Name	Header	Extended Header	Length	Address	Action	Cmd	Parameters	End
GET	0x55	0xF0	0x04	0x01	0x67	0x47 0x4D	0x4C 0x53 0x2D 0x33 0x30 0x30	0x0D
ACK			0x0A		0x06			
FAILED			0x04		0x15			

The parameters of ACK change to ASCII is LS-300

### 2.3.5.1 Get Network Configuration

	ASCII	Hex	Description
Cmd code	NC	0x4E 0x43	Get network interface configuration ex:eth0 Each parameter is separate by comma
Cmd/Rsp Parameter 1	0 1	0x30 0x31	eth0 eth1
Rsp parameter 2	0 1	0x30 0x31	Static DHCP
Rsp string 3			IP address
Rsp string 4			netmask address
Rsp string 5			broadcast address

#### Example

Name	Header	Extended Header	Length	Address	Action	Cmd	Parameters ( ASCII )	End
GET	0x55	0xF0	0x05	0x01	0x67	0x4E 0x43	1	0x0D
ACK			0x32		0x06		10,192.168.11 .254,255.255. 255.0,192.168 .11.255	
FAILED			0x05		0x15		1	



Since the ACK parameter for HEX is too long to read, so use the ASCII code for example.

The ACK parameter string can be separate by comma to 5 parts:

1. 1 : the network interface, here means eth1
2. 0 : the ip address is assigned by DHCP or static, here means static
3. 192.168.11.254 : the ip address
4. 255.255.255.0 : the netmask address
5. 192.168.11.255 : the broadcast address

# 3 Note

## 3.1

Commands are not accepted during media station boot-up.

## 3.2 Format ( Enable Checksum )

System supports both checksum and non-checksum commands.

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

- Header**  
**0x55** : Protocol header.
- Extended header**  
**0xF0** : disable checksum, please reference to [2.2](#)  
**0xFF** : enable checksum
- Length**  
 Length is a byte counter from **address to Checksum** field.

Example:

Name	Header	Extended Header	Length	Address	Action	Cmd	Parameters	Checksum	End
HEX	0x55	0xFF	0x06	0x01	0x73	0x4C 0x4F	0x01	0x16	0x0D

Total length = address 1 byte + action 1 byte + command 2 bytes + parameter 1 byte + checksum 1 byte = 6 bytes

- Address**  
 please reference to [2.2](#)
- Action**  
 please reference to [2.2](#)
- Cmd**  
 please reference to [2.2](#)

- **Parameters**

please reference to [2.2](#)

- **Checksum**

Checksum is a byte sum. Add the data from **length to parameters** field as unsigned binary numbers, discarding any overflow bits.

Example:

Sum =  $0x06+0x01+0x73+0x4c+0x4f+0x01 = 0x116$

Discarding overflow bits. Checksum =  $0x16$

- **End**

**0x0d** : Protocol end code