



# VS-LC101/ VS-LC102

## RS-232 command set

No	Issue Date	Description	Apply Firmware
1	2015/09/14	First version.	v3.1.5.28
2	2018/04/27	1. RS-232 command(Control Protocol) will respond ACK 2. RC pass-through control will respond ACK/NAK	v3.3.5.28

**\*Notice:**

1. The RS-232 command list is for VS-LC101/ VS-LC102.
2. The yellow highlight  means the latest update.
3. The blue highlight  means the deleted item.

## 1 Protocol Type

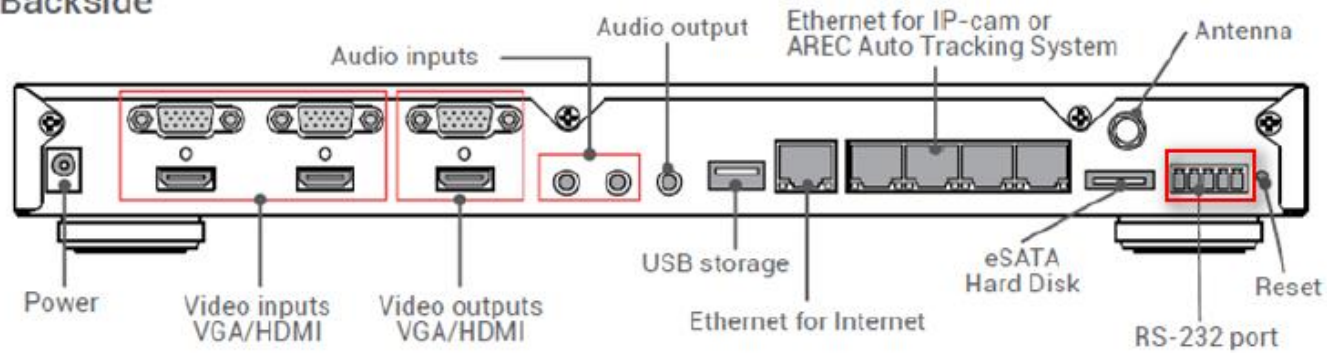
No.	Protocol	FW Version	Description
1	<b>RC Pass-Through Protocol</b>	FW before v3.3.5.28	RC(Remote control) pass-through protocol is used for an external device that want to simulate as an infrared remote controller. The operation transition with RC data field of the protocol is the same as from the infrared remote controller
2	<b>Control Protocol</b>	FW after v3.3.5.28(incl.)	The CaptureVision station can be controlled from an external controller through a serial RS-232 connection. Control protocol is used for the communication between the CaptureVision station and controller.

## 2 Configuration

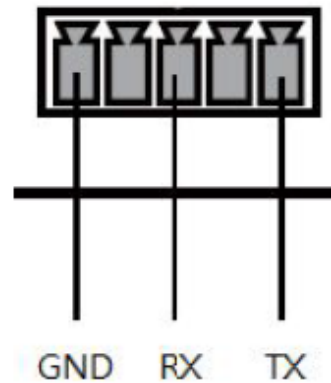
- Transmit Method: Asynchronous Interface Half Duplex Serial Communication
- Baud rate: 9600
- Start bit: 1 Bit
- Flow control: none
- Data length: 8 Bit
- Stop bit: 1 Bit

### 3 Hardware

#### ■ Backside



The pin definition of the RS-232 port :

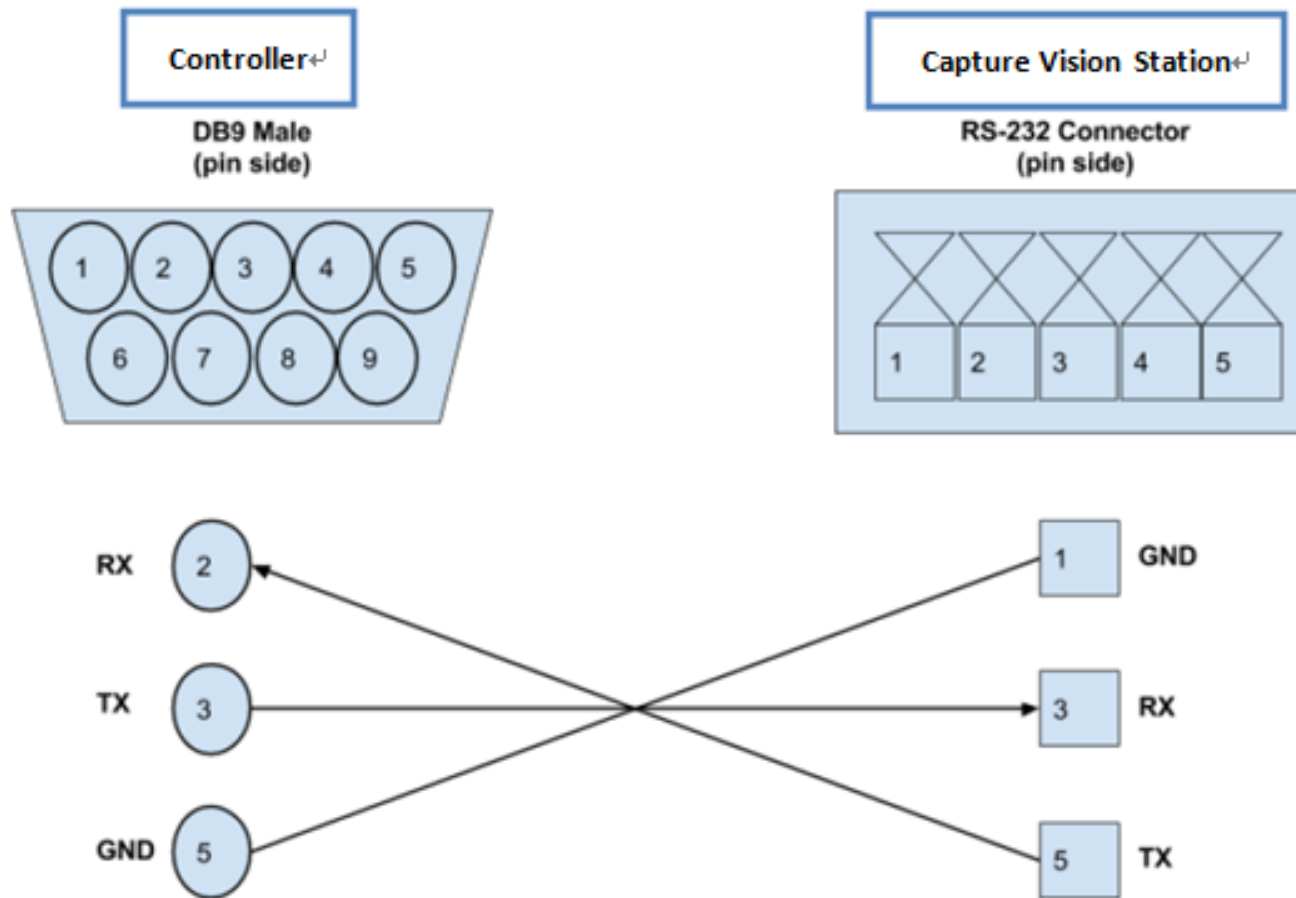


GND : Ground

RX : Receive Data

TX : Transmit Data

## 4 Connection



## 5 RC Pass-Through Protocol

### 5.1 Communication

5.1.1 PC or Controller send a command with 4Byte to CaptureVision Station

5.1.2 CaptureVision Station has Return command (FW after v3.3.5.28(incl.) will send ACK)

### 5.2 Command (Controller send to CaptureVision Station)

Name	Byte count	Hex	Description
Header (Start Command)	1	0x36	Remote control pass-through protocol
RC Length	1	0x01	Length is a byte counter in RC data field
RC code	1	Please refer to RC code tab for more information	
End	1	0x0D	End code of command

### 5.3 Response (CaptureVision to Controller)

Name	Byte count	Hex	Description
ACK/NAK	1	ACK: 0x06 NAK: 0x15	ACK: The command is accepted in the CaptureVision Station. NAK: The command is not accepted in the CaptureVision Station.
End	1	0x0D	End code of response

## 6 RC code

Funtion	RC Code (Hex)	Remark
Power off	0x0a	1. Power Off Lumens CaptureVision 2. This command can't power on Lumens CaptureVision)
Trigger ouput resolution auto scan	0x25	This command acts as the [Resolution] function on IR Remote Controller which is to trigger Output resolution auto scan and find the best resolution for the display.
A	0x22	IR remote controller "A" key
B	0x3f	IR remote controller "B" key
C	0x20	IR remote controller "C" key
D	0x24	IR remote controller "D" key
Number 0	0x28	Normal: NA IP Camera image enlarged: Call Camera P reset 0
Record layout 1 / Number 1	0x2a	Normal: Switch to Record layout 1 P Camera image enlarged: Call Camera P reset 1
Record layout 2 / Number 2	0x2b	Normal: Switch to Record layout 2 P Camera image enlarged: Call Camera P reset 2
Record layout 3 / Number 3	0x2c	Normal: Switch to Record layout 3 P Camera image enlarged: Call Camera P reset 3
Record layout 4 / Number 4	0x36	Normal: Switch to Record layout 4 P Camera image enlarged: Call Camera P reset 4
Record layout 5 / Number 5	0x1d	Normal: Switch to Record layout 5 P Camera image enlarged: Call Camera P reset 5
Record layout 6 / Number 6	0x34	Normal: Switch to Record layout 6

Funtion	RC Code (Hex)	Remark
		P Camera image enlarged: Call Camera P reset 6
Record layout 7 / Number 7	0x3c	Normal: Switch to Record layout 7 IP Camera image enlarged: Call Camera P reset 7
Record layout 8 / Number 8	0x0b	Normal: Switch to Record layout 8 P Camera image enlarged: Call Camera P reset 8
Record layout 9 / Number 9	0x0f	Normal: Switch to Record layout 9 P Camera image enlarged: Call Camera P reset 9
Record Start	0x1a	
Snapshot	0x18	
Menu	0x19	
Exit	0x0c	
Call Preview Layout Windows	0x00	
Up	0x08	
Left	0x07	
Right	0x06	
Down	0x09	
OK	0x1c	
Back	0x0c	
Aspect	0x0e	Aspect function on the IR remote control
Volume Up	0x03	
Volume Down	0x02	
Channel Up	0x1b	
Channel Down	0x0d	

Funtion	RC Code (Hex)	Remark
Mute	0x4c	
Information	0x11	
Call record Layout Window	0x16	
Play	0x14	
Pause	0x17	
Record Stop / Playback Stop	0x1f	
Last Course	0x13	
Next Course	0x15	
Last knowledge mark	0x10	
Next knowledge mark	0x12	
Save Camera Preset	0x30	IP Camera image enlarged: Save Camera Preset
Camera Zoom +	0x3e	
Camera Zoom -	0x2e	
Display Layout 1	0x40	Switch to Display Layout 1
Display Layout 2	0x41	Switch to Display Layout 2
Display Layout 3	0x42	Switch to Display Layout 3
Display Layout 4	0x43	Switch to Display Layout 4
Display Layout 5	0x44	Switch to Display Layout 5
Display Layout 6	0x45	Switch to Display Layout 6
Display Layout 7	0x46	Switch to Display Layout 7
Display Layout 8	0x47	Switch to Display Layout 8
Display Layout 9	0x48	Switch to Display Layout 9



## 7 Control Protocol

### 7.1 Communication

7.1.1 PC or Controller send a command with Header 0x55 to CaptureVision Station.

7.1.2 CaptureVision Station has Return command

7.1.3 FW after v3.3.5.28(incl.) supports Control Protocol

### 7.2 Command (Controller send to CaptureVision Satation)

Name	Byte count	Hex	Description
Header (Start Command)	1	0x55	Header 0x36 can be recognized as Control Protocol
Ectender Header	1	0xff	reserved for future use.
Lendth	1	0x0n	Length is a byte counter from <b>address to checksum</b> field. Counter = address 1 byte+action 1 byte+command 2 bytes+parameter 1 byte+checksum 1 byte Total length = 6 bytes
Address	1	0x01	Identification of device. Range is 0x01 ~ 0xff.(0 is reserved) *Address is reserved for future use. Don't care
Action	1	Pls refer to 2.2 Action Description	Pls refer to 2.2 Action Description
Command	2	Pls refer to 2.1 Command	
Parameters	n		Follow the command.
Checksum	1		Checksum is a byte sum.Add the data that from <b>length to parameters</b> field as unsigned binary numbers, discarding any overflow bits.
End	1	0x0d	End code of command

### 7.3 Action Description

Command / Response	Name	Hex	Description
Command	Get	0x67	“Query” operation for the CaptureVision station. <b>Please refer to "Action Get" Tab</b>
Command	Set	0x73	“Set” operation for the CaptureVision station. <b>Please refer to "Action Set" Tab</b>
Response	ACK	0x06	When the CaptureVision 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.
Response	NAK	0x15	When the CaptureVision station receives the protocol data correctly but there are something wrong while the CaptureVision station executes the correspond command. It replaces the action field with NAK in the received protocol format and return to controller.

### 7.4 Response (CaptureVision Station response to Controller)

7.4.1 If the Hex and format of the command are correct, it will reply the ACK or NAK with original format.

7.4.2 If the format is not recognized or the command is incorrect(e.g. wrong Checksum), the Response will be 0x15 0x0D

## 8 Action Set

### 8.1 "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
Record Layout	LO	0x4c 0x4f	Record Layout control
Display Layout	DP	0x44 0x50	Display Layout control
Audio Volume	AV	0x41 0x56	Audio volume control
Audio Mute	AM	0x41 0x4d	Audio mute control

### 8.2 Power

	ASCII	Hex	Description
Command	PW	0x50 0x57	
Parameter	0	0x30	Power off No Power on command due to the hardware limitation.

### 8.3 Record

	ASCII	Hex	Description
Command	RC	0x52 0x43	Start record process
Parameter			No need Parameter

### 8.4 Pause

	ASCII	Hex	Description
Command	PS	0x50 0x53	Pause record process
Parameter			No need Parameter

### 8.5 Stop Record

	ASCII	Hex	Description
Command	SP	0x53 0x50	Stop record process
Parameter			No need Parameter

### 8.6 Record Layout

	ASCII	Hex	Description
Command	LO	0x4c 0x4f	Set Record Layout ID
Parameter		0x01~0x09	Record Layout ID

### 8.7 Display Layout

	ASCII	Hex	Description
Command	DP	0x44 0x50	Set Display Layout ID
Parameter		0x01~0x09	Display Layout ID

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

### 8.8 Audio Volume

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

## 8.9 Audio Mute

	ASCII	Hex	Description
Command code	AM	0x41 0x4d	Set audio mute / unmute
Parameter 1	I	0x49	Set input volume
	O	0x4f	Set output volume
Parameter 2	1	0x31	Input: HDMI1; Output: Line out/HDMI out
	2	0x32	Input: HDMI2; Output: None
	3	x033	Input: JACK1 (Line In 1); Output: None
	4	0x34	Input: JACK2; Output: None
Parameter 3	0	0x30	Audio unmute
	1	0x31	Audio mute

## 9 Action Get

### 9.1 "Get" Action Command List

Command	ASCII	Hex	Description
Status	ST	0x53 0x54	System status
Record Layout	LO	0x4c 0x4f	Record Layout
Display Layout	DP	0x44 0x50	Display Layout
Audio Volume	AV	0x41 0x56	Audio volume

### 9.2 Status

	ASCII	Hex	Description
Command	ST	0x53 0x54	Get system status
Response Parameter	0	0x30	Uninitialize
	1	0x31	Ready
	2	0x32	Stopped
	3	0x33	Streaming
	4	0x34	Paused
	5	0x35	Waiting (stay in "Waiting" state while web administrator and director login)

### 9.3 Record Layout

	ASCII	Hex	Description
Command	LO	0x4c 0x4f	Set Record Layout ID
Parameter		0x01~0x09	Record Layout ID

### 9.4 Display Layout

	ASCII	Hex	Description
Command	DP	0x44 0x50	Set Display Layout ID
Parameter		0x01~0x09	Display Layout ID

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

## 9.5 Audio Volume

	ASCII	Hex	Description
Command code	AV	0x41 0x56	Get audio volume
Command/Respons Parameter 1	I	0x49	Get input volume
	O	0x4f	Get output volume
Command/Respons Parameter 2	1	0x31	Input: HDMI1; Output: Line out/HDMI out
	2	0x32	Input: HDMI2; Output: None
	3	x033	Input: JACK1 (Line In 1); Output: None
	4	0x34	Input: JACK2 (Line In 2);; Output: None
Respons Parameter 3		0x00 ~0x7d	Audio volume(0~50)

## 10 Control Example

### 10.1 Start Record

	Header	Extended Header	Length	Address	Action	Command	Parameters	Checksum	End
Send - Record Start	0x55	0xff	0x05	0x01	0x73	0x52 0x43		0x0e	0x0d
Response - Success (ACK)	0x55	0xff	0x05	0x01	0x06	0x52 0x43		0xa1	0x0d
Response - Failed (NAK)	0x55	0xff	0x05	0x01	0x15	0x52 0x43		0xb0	0x0d

### 10.2 Set Record Layout ID 1

	Header	Extended Header	Length	Address	Action	Command	Parameters	Checksum	End
Send - Set Record Layout ID 1	0x55	0xff	0x06	0x01	0x73	0x4c 0x4f	0x01	0x16	0x0d
Response - Success (ACK)	0x55	0xff	0x06	0x01	0x06	0x4c 0x4f	0x01	0xa9	0x0d
Response - Failed (NAK)	0x55	0xff	0x06	0x01	0x15	0x4c 0x4f	0x01	0cb8	0x0d

### 10.3 Get System status of CaptureVision Station

	Header	Extended Header	Length	Address	Action	Command	Parameters	Checksum	End
Send - Get System Status	0x55	0xff	0x05	0x01	0x67	0x53 0x54		0x14	0x0d
Response - ACK, System is ready	0x55	0xff	0x06	0x01	0x06	0x53 0x54	0x31	0xe5	0x0d
Response - Failed (NAK)	0x55	0xff	0x05	0x01	0x15	0x53 0x54		0xc2	0x0d

### 10.4 Get Record Layout ID of CaptureVision Station

	Header	Extended Header	Length	Address	Action	Command	Parameters	Checksum	End
Send - Record Layout ID	0x55	0xff	0x05	0x01	0x67	0x4c 0x4f		0x08	0x0d
Response - ACK, Record Layout ID	0x55	0xff	0x06	0x01	0x06	0x4c 0x4f	0x01	0xa9	0x0d



is 1									
Response - Failed (NAK)	0x55	0xff	0x05	0x01	0x15	0x4c 0x4f		0xb6	0x0d

### 10.5 Set Audio Line In 1 Mute

	Header	Extended Header	Length	Address	Action	Command	Parameters	Checksum	End
Send - Set Audio Line In 1 Mute	0x55	0xff	0x08	0x01	0x73	0x41 0x4d	0x49 x033 0x31	0xb7	0x0d
Response - Success (ACK)	0x55	0xff	0x08	0x01	0x06	0x41 0x4d	0x49 x033 0x31	0x4a	0x0d
Response - Failed (NAK)	0x55	0xff	0x08	0x01	0x15	0x41 0x4d	0x49 x033 0x31	0c59	0x0d