

DigiBird Video Wall controller Communication Protocol

1. Communication

There are two communication methods between VWC and PC:

1.1 RS232

Directly connect PC with the VWC via RS232 serial cable, with the PC serial port setting as: Baud Rate 96001, Stop Bit, and No Parity.

1.2 UDP

Connect PC with the VWC via Ethernet cable, the PC sends one UDP message to the port 5000 of VWC, each UDP packet takes one command.

The RS232 and UDP methods can work simultaneously, but the VWC only proceed one command from RS232 or UDP, while the other command will be ignored.

The VWC embedded with one 485 or 232 cascaded port (or loop out port), which is used to transfer command to the lower level cascaded VWC devices. When implementing UDP communication, the message sent from the PC to the 5001 port of the VWC will be automatically transferred to the cascaded port

2. Command Format

Communication between PC and VWC is using bidirectional protocol, and the format is:
<Command,Param1,Param2,...ParamN>

This Command Set adopts ASCII Code, no case-sensitive, 4 characters. Each command starts with “[” and ends with “]”, adopting half-width “,” to separate each parameter; space character among command is prohibited.

All commands are sent initiatively from PC to VWC, and feedbacks/response may include:
Command/order executed correctly, if the command is unidirectional the VWC will response with message:

[Command,OK]

Command/order executed correctly, if the command is to read info from VWC, the VWC will response with message:

[Command,Param1,Param2,...ParamN]

...

[Command,OK]

According to different commands, the VWC will response one or several messages with parameters, and end with OK.

Command/order executed failed because of format error or incompatible version, the response will be:

[ERR]

Command Timeout

When the VWC is in progress of executing the current command, then the second received command will be disregarded and result in no feedback/response to PC.

Generally, please set 1 second timeout check after PC sending previous command. to the port ring 5001 out of the serial port.

3. Parameter Convention

Following are some main parameters in this protocol:

3.1 Channel

The main number of Input Channel, being used to identify one main input signal source, start from 1.

The physical input slot of chassis identifies the number of Input channel. On the VWC, there are several input slots and each slot can house different input cards like DVI, VGA and 8-channel video card, etc.

Normally, each input slot is allocated with four (4x) channels with (1, 2, 3, 4), even for a vacant slot, the numbers should be reserved.

If input cards are positioned/installed/inserted vertically, the numbers count from the left to the right. If horizontally, the numbers count from the up to the bottom.

In terms of four-channel input cards like HDMI or DVI cards, Input A, B, C and D are numbered by 1, 2, 3, 4 accordingly (A-1, B-2, C-3 and D-4) of the card. In terms of single-channel cards like 4k HDMI output card for U and T series controller, only number 1 is used, leave number 2, 3, and 4 vacant.

3.2 Sub-channel

For 8-channel and 16-channel cards, using 4 numbers can't identify all channels, we need adopt sub-channel number to identify other channels.

For the 8-channel card (2012 version), main channel is 1, 2, 3, 4, and each main channel with 2x sub-channel (0, 1).

In most cases, using main channel number to identify and set the sub-channel as 0.

For example, one chassis with 6x input slots:

Input card	Input A	Input B	Input 3	Input 4
DVI: Input 1,2,3,4	Main channel 1, Subchannel 0	Main channel 2, Subchannel 0	Main channel 3, Subchannel 0	Main channel 4, Subchannel 0
VGA: Input 1,2,3,4	Main channel 5, Subchannel 0	Main channel 6, Subchannel 0	Main channel 7, Subchannel 0	Main channel 8, Subchannel 0
Vacant Slot	Number9 Reserved	Number 10 Reserved	Number 11 Reserved	Number 12 Reserved
SDI: Input 1	Main channel 13, Subchannel 0	Number 14 Reserved	Number 15 Reserved	Number 16 Reserved
Vacant Slot	Number 17 Reserved	Number 18 Reserved	Number 19 Reserved	Number 20 Reserved
Video5: V1 V2 V3 V4 V5 V6 V7 V8	Main channel21, Subchannel 0, 1 V1=0, V2=1,	Main channel 22, Subchannel 0,1 V3=0, V4=1,

3.3 W_ID

W_ID: Refers to windows ID, the range is $1 \leq W_ID \leq 65535$.

The windows ID is used to control the window operation, the ID of closed window can be used for other windows.

3.4 Coordinate

Coordinate (by pixel) is used to identify the window position and size on the video wall.

(X0, Y0) is the top left point of window, (x1,Y1) is the coordinate for bottom right point.

For example, a full screen window on top left 1024x 768 monitor, the original coordinate is (0, 0) and the end (bottom right) is (1024, 768).

4. Command

The main operation of windows including, Open, Close, Moving, Resize, Top, Bottom and channel switching.

4.1 Open Window

<open,W_ID,Channel,SubChannel,x0,y0,x1,y1>

This command is to create a new window.

Parameter	Function	Description
W_ID	Window ID	Be used to identify specific window, if open a new window by existing ID(one window for this ID is open), the existing window will be closed.
Channel	Main channel number	Refer to the Command Convention
SubChannel	Sub channel number	Refer to the Command Convention
x0,y0	Original coordinate	Refer to the Command Convention
x1,y1	End point coordinate	Refer to the Command Convention

Successful and response:

<OPEN,OK>

4.2 Shutdown/Close window

<shut,W_ID >

Successful and response:

<SHUT,OK>

4.2 Move window

<move,W_ID,Channel,SubChannel,x0,y0,x1,y1>

Successful and response:

<MOVE,OK>

4.3 Resize the window

<size,W_ID,Channel,SubChannel,x0,y0,x1,y1>

This command is to adjust the size of the window.

Successful and response:

<SIZE,OK>

4.4 Adjust the layering

<movz,W_ID,ZOrder>

This command is to change the layering of multiple windows.

Parameter	Function	Description
W_ID	Window ID	Refer to the Command Convention
ZOrder	The layer order of windows	1≤ZOrder≤n, 1 indicates the bottom layer, n indicates the upper layer. (n is the total number of windows)

Successful and response:

<MOVZ,OK>

4.5 Shutdown/Close all windows

<sall>

This command is to shut down all windows.

Successful and response:

<SALL,OK>

4.7 Input Cropping

Below commands are added to enable the operation of cropped input source.

OPE2, the command to open cropped input

SIZ2, the command to resize cropped input

MOV2, the command to move cropped input

CAL2, the command to recall the saved scene with cropped input

The command protocol is the same to previous protocol except for adding the cropped pixel number of Left, Top, Right, Bottom.

For example, the command to open 2 cropped input, with cropped 10 pixels to left, 20 pixels to Top, 25 pixels to right and 30 pixels to bottom.

<OPE2,1,1,0,0,0,1920,1080,10,20,25,30>

4.8 Input Switching

The command is used to switch another input to replace the current input.

<SWCH,SourceChl,SubChl,W_ID>

For multiple grouping device, the below command applies.

<SWCH,SourceChl,SubChl,W_ID,Group>

Return

<SWCH,OK>

Parameter	Item	Description
SourceChl	Channel Number	Start from 1
SubChl	Sub-Channel Number	
W_ID	Window ID	
Group	Video wall number	From 1 to 4

For example, the command switching the channel number 1 input to window ID 1.

<SWCH,1,0,1>

4.9 Save scene/ template

<save,SCENE_ID>

This command is to save the scene/template to the VWC.

Parameter	Function	Description
SCENE_ID	Scene ID number	Is numbering from 1 to 32.

When saving scene, the new scene will replace old scene, if both of scenes with the same ID.

Successful and response:

<SAVE,OK>

4.10 Recall saved scene

<call,SCENE_ID >

This command is to recall the saved scene, when the scene ID is 0, the VWC will display the current displaying image.

Successful and response:

<CALL,W_ID,Channel,x0,y0,x1,y1,SubChannel >

...

<CALL,OK>

In above response, each string indicates one window and end with <CALL,OK>.

4.11 Commands for multiple video wall

Reading the working status of multiple video wall for U and T series video wall controller.

<RCNG>

Successfully return

<RCNG,s1,s2,s3,s4>

<RCNG,OK>

S1-S4 representing the working status for 4x independent video wall, '1' representing enable, '0' represents unable.

Note: Multiple video wall management is optional instead of default.

For example

<RCNG>

<RCNG,1,1,1,1>

<RCNG,OK>

It represents the 4 video wall are all enabled.

The following commands also work for multiple video wall by adding the video wall number 1, 2, 3, 4 to represent video wall.

OPEN,OPE2,SHUT,MOVE,SIZE,MOV2,SIZ2,SAVE,CALL,MOVZ,SALL,SCN2,RCN2,CAL2,TCOL,TGRD,TMO D.

For example, recall the Scene 1 of number 1 video wall.

<CALL,SCENE_ID ,1>

5. Commands for Controller communication

5.1 Network Connection Setup

<snet,mac,ip,mask,gate>

Setup the MAC, IP, sub mask and gate.

Parameter	Function	Description
mac	MAC address	
ip	IP address	
mask	Sub Mask	
gate	Gate number	

Successful and response:

<SNET,OK>

5.2 Read the setup of network connection

<rnet>

This command is to read the data of MAC, IP, Sub Mask and Gate.

Successful and response:

<RNET,ip,mask,gate ,mac>

<RNET,OK>

For example:

The controller reads the network configuration

<RNET >

Return configuration information

<The RNET, , 0,8,220,5,88,24,192,168,1,49,255,255,255,0,192,168,1,1>

<RNET, OK>

5.3 Read the ID of device

<REID>

Successful and response:

<REID,N1,N2,N3,N4>

<REID,OK>

N1,N2,N3 and N4 within the range of 1 to 255.

5.4 Read the current time of device

<RTIM>

Successful and response:

<RTIM,y,n,d,h,m,s>

<RTIM,OK>

Y: Year; N: Month; D: Date; H: Hour; M: minutes; S: seconds;

5.5 Read the expired date

<RDQT>

Successful and response:

<RDQT,y,n,d,h,m,s>

<RDQT,OK>

Y: Year; N: Month; D: Date; H: Hour; M: minutes; S: seconds;

6. Commands for VWC2

6.1 Read the scene list

Read a list of existing scenes

Example:

<RLST,Group >

<RLST,SUM,index ,ID,name>

<RLST,SUM,index,ID,name >

<RLST,ok>

parameter	Features	Explanation
Group	Multiple video wall group number	
sum	The total number of scenes	
The Index	The scene order, start from 1	
Id	Scene number	

6.2 Rename the scene

Rename the existing scene

Example:

<SREN,id,name,group>

<SREN,ok>/<err>

Parameter	Features	Explanation
ID	Scene number	
NAME	Scene name	
Group	Multiple video wall group number	

6.3 Delete scenes

Read a list of scenes on existing splicer

Example:

<SDEL,id, group>

<SREN,ok>/<err>

Parameter	Features	Explanation
ID	Scene number	
Group	Multiple video wall group number	

6.4 Read Preview Card

Read the configured preview card list

Example:

<RPRS >

<RPRS,aChannel,ip,mask,gate>

<RPRS,aChannel,ip,mask,gate>

<RPRS,ok>

Parameter	Description
aChannel	Channel number
IP	IP addresses
MASK	Subnet Mask
GATE	Gateway

6.5 Read Scrolling Text

Send:<RRSD>

Recv:<RRSD,group,x0,y0,fColor,bkgColor,transp,fontName,text,fontPercent>windowWidth,w
indowHeight,dataWidth,dataHeight,stepping,mode,statue,bkgColorFlag>

Recv:<RRSD,ok>

Parameter Description

Item	Parameter	Description	Explanation
0	group	Multiple video wall group number	
1	X0	Window on the big screen in the Z coordinate	
2	Y0	Window on the big screen Y coordinate	
3	fColor	Foreground color	Hex color code, such as # FFB6C1
4	bkgColor	Background Color	Hex color code, such as # FFB6C1
5	Transp	Transparency, currently does not support.	
6	fontName	Fonts	0: Song 1: bold 2: Non italics 0-2 Tahoma
7	Text	Content subtitles	
8	fontPercent	The ratio of font size and window	
9	windowWidth	The width of the window displayed on the large screen	
10	windowHeight	Height of the display window on the big screen	Currently, only lateral movement and height of the window it is

			required to ensure consistent height data
11	dataWidth	Text width	Data width larger than the width of the window may be
12	dataHeight	Text Height	Currently, only lateral movement and height of the window it is required to ensure consistent height data
13	S tepping	Text moving speed 0-9	From 0 to 9
14	M the ODE	Scroll mode, only 0	0, from Right to Left
15	Status	Whether enable the scrolling text	0 No, 1 Yes
16	bkgColorFlag	Whether enable the background	0 NO, 1 Yes

6.6 Scrolling Text Setup

Send:<WRSD,group,x0,y0,fColor,bkgColor,transp,fontName,text,fontPercent>windowWidth,windowHeight,dataWidth,dataHeight,stepping,mode,statue,bkgColorFlag>

Recv:<WRSD,ok>

6.7 Enable Scrolling Text

Send:<SRSD >

Recv:<SRSD,ok>

6.8 Disable Scrolling Text

Send:<ERSD >

Recv:<ERSD,ok>