

Serial Command Structure

The Optika Collaborate UHD series feature an RJ-45 Ethernet port for control and monitoring over a network.

This application note introduces the two user interface modes:

Command line direct mode

Browser based web server mode

There is also a short overview of the command set and how it is implemented.

QUICK GUIDE

For experienced users the following quick guide to trying out the network connection and functions may be useful.

Command line direct mode: This is relevant when a PC application is used to send and receive commands over the network port.

Browser based web server mode : The network port will require an alternative firmware version if the browser based web server mode is required.

* Works with a normal network with DHCP, i.e. must use a router.

* Connect the display to the network and ensure power is on.

* Use the IP Locator utility available from the IP-60 web-page. <http://www.digitalview.com/media/downloads/IPLocator.zip> (Windows only)

* Double click on the IP address in the **IP Locator** window, it will open the SVX-4096 browser page in your default browser. Alternatively copy the IP address into your browser address line.

* Test the functions that come up on the browser.

PIN#	DESCRIPTION
2	RS-232 Rx Data
3	RS-232 Tx Data
6	RS-232 Rx Data
5	Ground

Quick Guide



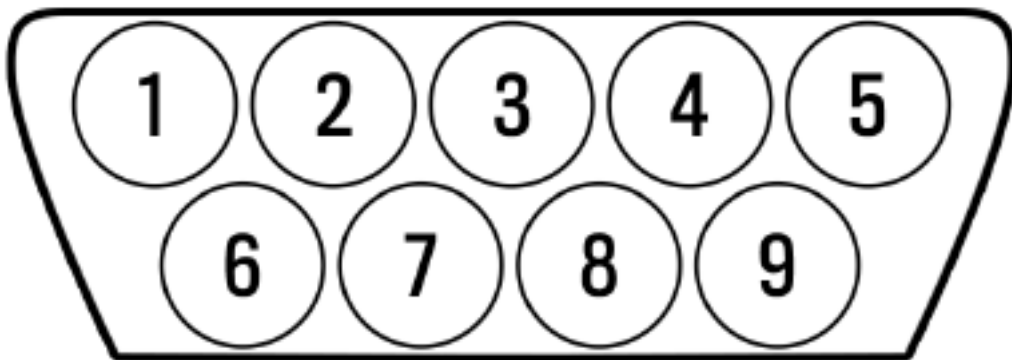
RS-232 control protocols and command set

RS-232 Serial control (Baud rate 2400),8 bits, 1 stop bit and no parity

Physical connection:

Connector Interface: Serial port

Mating Connector: DB9 Female



Mating face of RS-232 DB9 Male

PIN #	Description
2	RS-232 Rx Data
3	RS-232 Tx Data
6	RS-232 Rx Data
5	Ground

The "OSD" function can be controlled through sending the [RS-232](#) protocol.

The [RS-232](#) program can be custom-made to fit for application or it can be used the serial control program, like Accessport, Telix or Serial Utility program developed by DigitalView. Please contact your local support for information.

1. Commands to implement switch mount control buttons

Function	Command	Description	Remark
Menu button	0xf7	Menu button pressed	Button equivalent
Select-down button	0xfa	Select-down button pressed	Button equivalent
Select-up button	0xfb	Select-up button pressed	Button equivalent
Right/+button	0xfc	Right/+button pressed	Button equivalent
Left/-button	0xfd	Left/-button pressed	Button equivalent

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2. Parameter setting - immediate, relative, reset and query

Function	Command	Description	Acknowledge (if enabled)
Brightness Control	0x81, nn "+" "-" "r" "R" "?" " "m" "n"	Set brightness = value/increment/ decrement Reset Query Current Source Maximum query Minimum query	nn = 0x00~ 0x64 (0~100%) Default: 0x32 (50%)
Contrast control	0x82 nn "+" "-" "r" "R" "?" " "m" "n"	Set contrast = value/increment/ decrement Reset Query Maximum query Minimum query	nn = 0x00~ 0x64 (0~100%) Default: 0x32 (50%)
Color saturation control	0x83 nn "+" "-" "r" "R" "?" " "m" "n"	Set color saturation = value/increment/ decrement Reset Query Maximum query Minimum query	nn = 0x00~ 0x64 (0~100%) Default: 0x32 (50%)
Hue control	0x84 nn "+" "-" "r" "R" "?" " "m" "n"	Set tint= value/ increment/decre- ment Reset Query Maximum query Minimum query	nn = 0x00~ 0x64 (0~100%) Default: 0x32 (50%)

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Parameter setting - immediate, relative, reset and query (continued)

Function	Command	Description	Acknowledge (if enabled)
Phase control (only for VGA port)	0x85, nn "+" "-" "?"	Set phase = value/ increment/decrement Query	nn = 0x00~ 0x64 (0~100%)
Image H position (only for VGA port)	0x86, nn "+" "-" "r" "R" "?"	Set horizontal position = value/ increment/ decrement Reset Query	nn = 0x00~ 0x64 (0~100%)
Image V position (only for VGA port)	0x87, nnnn "+" "-" "r" "R" "?"	Set vertical position = value/ increment/ decrement Reset Query	nn = 0x00~ 0x64 (0~100%) Default: 0x32 (50%)

Quick Guide



Parameter setting - immediate, relative, reset and query (continued)

Function	Command	Description	Acknowledge (if enabled)
Sharpness	0x8a, n "+" "-" "r" "R" "?"	Set sharpness = value/increment/decrement Reset Query	nn = 0x00~ 0x64 (0~100%) Default: 0 x32 (50%)
Clock Control (only for VGA port)	0x8b, n "+" "-" "r" "R" "?"	Set VGA clock= Value/ increment/decrement Query	nn = 0x00~ 0x64 (0~100%)
Aspect Ratio	0x8c, "0" "1" "9" "A" "F" "r" "R" "?"	Set video aspect ratio = Value Reset Query	"0" – 1:1 " "1" – fill screen (Default) "9" – 4:3 "A" – 16:9 "F" – 5:4
Set display orientation	0x8e, n "r" "R" "?"	Set display orientation = value Reset Query	"0" – normal (0 degree) (Default) "4" – rotated 90 "5" – rotated 180 "6" – rotated 270 <i>Note: Rotation is only allowed in 1P mode</i>
Rotate OSD	0x8f, "0" "1" "3" "?"	Normal OSD rotate rotated 90 rotated 270 Query	"0" – normal OSD. (Default) "1" –rotated 90 OSD. "3" – rotated 270 OSD.

Quick Guide



Parameter setting - immediate, relative, reset and query (continued)

Function	Command	Description	Acknowledge (if enabled)
OSD H position	0x90, nn "+" "-" "r" "R" "?"	Set OSD horizontal position = value/ increment/decrement Reset Query	nn = 0x00~ 0x64 (left ~ right) Default: 0x32 (middle)
OSD V position	0x91, nn "+" "-" "r" "R" "?"	Set OSD vertical position = value/increment/decrement Reset Query	nn = 0x00~ 0x64 (top ~ bottom) Default: 0x32 (middle)
OSD transparency	0x92 nn "+" "-" "r" "R" "?"	Set OSD transparency = value/increment/decrement Reset Query	nn = 0x00~ 0x64 (0~100%) Default: 0x00 (No trans- parency)
OSD menu timeout	0x93 nn "+" "-" "r" "R" "?"	Select menu timeout = value/increment/decrement Reset Query	OSD menu timeout value.nn = 0x0A – Always on nn = 0x0B - 0x3C (11~60sec) Default: 0x0B (11sec)

Quick Guide



Parameter setting - immediate, relative, reset and query (continued)

Function	Command	Description	Acknowledge (if enabled)
Input main video (P1) select	0x98, nn "+" "-" "r" "R" "?"	Select P1 video input = value/next in put/previous input Reset Query	"nn" = "0x41,0x31" A0: VGA "0x50, 0x31" D0: DP (Default) "0x48,0x31" D1: HDMI "0x48,0x32" D2: HDMI "0x48,0x33" D3: HDMI "0x46,0x31" D4: DVI
Auto source seek	0x99, "0" "1" "r" "R" "?"	Set auto source seek = Disable/Enable Reset Query	Default: "1" (Enable)
Source Layout	0x9a, n "r" "R" "?"	Select video source layout = Single, PIP , PBP, 4P Reset, Query	"n": "0"- 1P (Single) (Default) "1"- 2P PIP "2"- 2P PBP (Left Right) "3"- 2P PBP (Top Bottom) "4"- 4P
GAMMA value select	0x9d, n "r" "R" "?"	Select GAMMA value = Value Reset Query	"n": "5" – 1.8, "7" – 2.0, "2" – 2.2, (Default) "A" – 2.4

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Parameter setting - immediate, relative, reset and query (continued)

Function	Command	Description	Acknowledge (if enabled)
Auto power off	0x9f, "0" "1" "r" "R" "?"	Set auto power save option = Disable/Enable Reset Query	"n": "0" – Disable auto power off "1" – Enable auto power off (Default)
Power On/Off	0xc8, "0" "1" "?"	Soft power off/on query	"0" – soft power off. "1" – soft power on.
Hot key 1 (plus and minus keys)	0xa0, "1", n "r" "R" "?"	Set Hot key 1= Value Reset Query	"n": "1" – volume "2" – brightness "3" – contrast "4" – color saturation "5" – input source (P1 source) "9" – PIP size "B" – No hot key function (Default) "D" – PIP Swap "E" – Aspect ratio "G" – Hue "H" – Backlight level "I" – VGA Auto picture adjust "L" - Sharpness "M" - Display mode (select 1P, 2P PIP, 2P PBP or 4P)

Quick Guide



Parameter setting - immediate, relative, reset and query (continued)

Function	Command	Description	Acknowledge (if enabled)
Hot key 2 (plus and minus keys)	0xa0, "2", n "r" "R" "?"	Set Hot key 2= Value Reset Query	"n": "1" – volume " 2" – brightness "3" – contrast " 4" – color saturation "5" – input source (P1 source) "9" – PIP size " B" – No hot key function (Default) " D" – PIP Swap " E" – Aspect ratio " G" – Hue "H" – Backlight level "I" – VGA Auto picture adjust "L" - Sharpness "M" - Display mode (select 1P, 2P PIP, 2P PBP or 4P)
Runtime counter	0xa1, nnnnn "r" "R" "?"	Set runtime counter value = nnnnn (* 0.5 hour) Reset to zero Query	Runtime = nnnnn. Max. input = 0x1fffe (0x1fffe * 0.5 hour = 65535 hours) Runtime counter counts when backlight is on

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Parameter setting - immediate, relative, reset and query (continued)

Function	Command	Description	Acknowledge (if enabled)
PIP H position	0xa4, nn "+" "-" "r" "R" "?"	Set PIP horizontal position= value/go right/go left Reset Query	PIP window horizontal position. nn: 0x00(left)~0x64(right) Default: 0x64
PIP V position	0xa5, nn "+" "-" "r" "R" "?"	Set PIP vertical position= value/go down/go up Reset Query	PIP window vertical position. nn: 0x00(top)~0x64(bottom) Default: 0x64
PIP window size select	0xa6, nn "r" "R" "?"	Select PIP window size = PIP window size value Reset Query	nn: 0x00(smallest) ~0x0A (largest) Default: 0x0A
PIP /P2 source select	0xa7, nn "r" "R" "?"	Select PIP or P2 video source = Video source value Reset Query	P2 is: 2P PBP left right: right window 2P PBP top bottom: bottom window 4P: lower left window

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Parameter setting - immediate, relative, reset and query (continued)

Function	Command	Description	Acknowledge (if enabled)
			<p>“nn” = “0x41,0x31” A0: VGA “0x50,0x31” D0: DP “0x48,0x31” D1: HDMI (Default) “0x48,0x32” D2: HDMI “0x48,0x33” D3: HDMI “0x46,0x31” D4: DVI</p> <p>Please note the PIP or PBP mode should be enabled first before select video source.</p>
P3 source select	0xa7, “c” nn “r” “R” “?”	Select P3 video source = Video source value Reset Query	<p>P3 is upper right window in 4P mode “nn” = “0x41,0x31” A0: VGA “0x50,0x31” D0: DP “0x48,0x31” D1: HDMI “0x48,0x32” D2: HDMI (Default) “0x48,0x33” D3: HDMI “0x46,0x31” D4: DVI</p> <p>Please note the 4P PBP mode should be enabled first before select video source.</p>
P4 source select	0xa7, “d” nn “r” “R” “?”	Select P4 video source = Video source value Reset Query	<p>P4 is in the lower right window in 4P mode “nn” = “0x41,0x31” A0: VGA “0x50,0x31” D0: DP “0x48,0x31” D1: HDMI “0x48,0x32” D2: HDMI (Default) “0x48,0x33” D3: HDMI “0x46,0x31” D4: DVI</p> <p>Please note the 4P PBP mode should be enabled first before select video source.</p>

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Parameter setting - immediate, relative, reset and query (continued)

Function	Command	Description	Acknowledge (if enabled)
Color temperature select	0xb3, n "r" "R" "?"	Select color temperature = value Reset Query	"n" = 2" – 6500K. (Default) "4" – User "5" – 9300K "6" – 7500K "7" – 5800K "8" – sRGB
Red level of User color temperature	0xb4, nn "+" "-" "r" "R" "?" "m" "n"	Set the level of the red channel for the user color temp. = value/increment/decrement Reset Query Maximum query Minimum query	nn: 0x00~ 0xff (0~255) Default: 0x80
Green level of User color temperature	0xb5 nn "+" "-" "r" "R" "?" "m" "n"	Set the level of the green channel for the user color temp. = value/increment/decrement Reset Query Maximum query Minimum query	nn: 0x00~ 0xff (0~255) Default: 0x80

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Parameter setting - immediate, relative, reset and query (continued)

Function	Command	Description	Acknowledge (if enabled)
Blue level of User colour temperature	0xb6 nn "+" "-" "r" "R" "?" "m" "n"	Set the level of the blue channel for the user colour temp. = value/increment/decrement Reset Query Maximum query Minimum query	nn: 0x00~ 0xff (0~255) Default: 0x80
Video horizontal resolution enquiry	0xb7	Horizontal resolution (in pixels) in 3 to 4 digit hex number	
Video vertical resolution enquiry	0xb8	Vertical resolution (in pixels) in 3 to 4 digit hex number	

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Parameter setting - immediate, relative, reset and query (continued)

Function	Command	Description	Acknowledge (if enabled)
Video horizontal sync frequency	0xb9	Horizontal sync frequency (in units of 100Hz) in 3 digit hex number	
Video vertical sync frequency	0xba	Vertical sync frequency (in units of Hz) in 3 digit hex number and 1 char	“nnnc” = vertical frequency nnn = 3 digit hex c= “i” (interlace) or “p” (progressive)
Query video input status	0xc9	Query the status of the primary & pip status	“nn,nn” = input status “nn,xx” digit = primary status: “0,”0” : invalid “P,” 1” DisplayPort “H,” 2” HDMI2 “H,” 3” HDMI3

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Parameter setting - immediate, relative, reset and query (continued)

Function	Command	Description	Acknowledge (if enabled)
			<p>“xx,nn”= PIP input status/Bottom in PBP/Right in PBP/ Left Bottom in 4P: “ 0”,“0”: invalid “ F”,“1” DVI “H,”1” HDMI “P,” 1” DisplayPort” “H,” 2” HDMI2 “H,” 3” HDMI3</p> <p>xx,nn “ = Right Top in 4P “P,” 1” DisplayPort “H,” 1” HDMI1 “H,” 2” HDMI2 “H,” 3” HDMI3 “F” , “ 1” DVI</p>
			<p>“xx,nn”= PIP input status/Right Bottom in 4P: “ F”,“1” DVI “H,”1” HDMI “ P,” 1” DisplayPort” “H,” 2” HDMI2 “H,” 3” HDMI3</p>

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Parameter setting - immediate, relative, reset and query (continued)

Function	Command	Description	Acknowledge (if enabled)
OSD status enquiry	0xbb	Status of OSD	"0" – OSD turned off "1" – OSD turned on
Display video information box	0xbc, "?" "0" "1"	Query No video info box shown After switching to a new video source, the video info box is displayed for 5 seconds.	"0" – disabled. "1" – enabled. (Default)
Query BIOS version	0xcb, "0"	Read BIOS version	BIOS version "VV.YY.ZZ" VV = VO or EO, VO = Release version EO = Engineering Sample YY= Version Number ZZ= Customer Number
OSD turn off	0xbd	Turn off the OSD.	"0" – fail. "1" – successful.
Backlight control	0xe0, nn "+" "-" "R" "r" "?"	Set Backlight level = value/increment/decrement Reset Query	nn = 0x00~ 0x64 (0~100%) Default: 0x64 (100%)

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Parameter setting - immediate, relative, reset and query (continued)

Function	Command	Description	Acknowledge (if enabled)
Backlight On/Off	0xe1, "0" "1" "R" "r" "?"	Backlight Off / Backlight On Reset Query	"0" – Backlight Off "1" – Backlight On. (Default)
Swap PIP / 2P PBP video source	0xe3	Swap Main and PIP Source (PIP mode), left & right source (PBP LR) or Top & Bottom (PBP TB)	"0" – fail. " "1" – successful.
Backlight DA/ PWM	0xe5 "0" "1" "R" "r" "?"	Set backlight control method: PWM / DA Reset Query	"0" – PWM (Default) "1" – D/A

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Parameter setting - immediate, relative, reset and query (continued)

Function	Command	Description	Acknowledge (if enabled)
Backlight PWM frequency	0xe6, nnn "+" "-" "R" "r" "?"	Set backlight PWM frequency = value/increase 20Hz/ decrease 20Hz Reset Query	Value 100Hz : "0","6","4" 120Hz : "0","7","8" 140Hz : "0","8","C" 160Hz : "0","A","0" (Default) 180Hz : "0","B","4" 200Hz : "0","C","8" 220Hz : "0","D","C" 240Hz : "0","F","0" 260Hz : "1","0","4" 280Hz : "1","1","8" 300Hz : "1","2","C" 320Hz : "1","4","0" 340Hz : "1","5","4" 360Hz : "1","6","8" 380Hz : "1","7","C" 400Hz : "1","9","0" 420Hz : "1","A","4" 440Hz : "1","B","8"
Backlight Invert	0xe7 "0" "1" "R" "r" "?"	Set invert backlight level : Off / On Reset Query	"0" – Off (Default) "1" – On
PIP window transparency Level	0xed, nn "+" "-" "R" "r" "?"	Set invert backlight level : Off / On Reset Query	"0" – Off (Default) "1" – On

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Parameter setting - immediate, relative, reset and query (continued)

Function	Command	Description	Acknowledge (if enabled)
Minimum back-light level	0xee, "0x5C" nn "+" "-" "R" "r" "?"	Set minimum backlight level= value/increment/decrement Reset Query	Minimum Backlight value. nn: 0x00 ~ 0x32 (0~50%) Default: 5%
OSD switch mount Lock	"0xee", "0x62" "0" "1" "?"	Unlock / Lock Query	"0" - Unlock (Default) "1" - Lock, no response to OSD switch mount keys
Color Effect	"0xee", "0x71", "0x30" "1" "2" "3" "4" "5" "?" "r" "R"	Select Color Effect Value Query Reset	"0" = Standard (Default) "1" = Game "2" = Movie "3" = Photo "4" = Vivid "5" = User
Vby1 pin setting	"0xee", "0x73", 0x30 0x31 ... 0x39, '0' "1"	Set Vby1 pin state Pin no.: 0x30=pin15, 0x31=pin16,..., 0x39=pin24 Pin logic level	"0" = set to low (Default) "1" = set to high

Quick Guide



The **RS-232 command strings** sent in one time can support up to **380 bytes** via **CN8 port** The **RS-232** command string sent in one time can support up to **50 bytes** via **CN1** or **J1 port**.

n = 1-byte ascii-coded hex number, e.g., parameter value of 0x1 is represented by "1" (0x31). mn or nn = 2-byte ascii-coded hex number, e.g., parameter value of 0x1e is represented by "1", "e" | "E" (0x31, 0x6e | 0x4e).

Please refer to the ASCII to Hex convert table on the next page.

Quick Guide



HEX	ASCII	HEX	ASCII	HEX	ASCII	HEX	ASCII
0x30	0	0x41	A	0x61	a	0x2B	+
0x31	1	0x42	B	0x62	b	0x2D	-
0x32	2	0x43	C	0x63	c	0x3F	?
0x33	3	0x44	D	0x64	d		
0x34	4	0x45	E	0x65	e		
0x35	5	0x46	F	0x66	f		
0x36	6	0x47	G	0x67	g		
0x37	7	0x48	H	0x68	h		
0x38	8	0x49	I	0x69	i		
0x39	9	0x4A	J	0x6A	j		
		0x4B	K	0x6B	k		
		0x4C	L	0x6C	l		
		0x4D	M	0x6D	m		
		0x4E	N	0x6E	n		
		0x4F	O	0x6F	o		
		0x50	P	0x70	p		
		0x51	Q	0x71	q		
		0x52	R	0x72	r		
		0x53	S	0x73	s		
		0x54	T	0x74	t		
		0x55	U	0x75	u		
		0x56	V	0x76	v		
		0x57	W	0x77	w		
		0x58	X	0x78	x		
		0x59	Y	0x79	y		
		0x5A	Z	0x7A	z		