



## RS-232 Command Set for SVX-1920

Version : 0.1 (initial draft)

**Designed for LCD monitor and display systems, the SVX-1920 is a high quality, feature rich interface controller for LCD panels. One of its advanced features is a very extensive RS-232 command set enabling a wide range of functions and add-on capabilities for a display system.**

This document provides a full list of the RS-232 command set available.

### **IMPORTANT USAGE NOTE**

Digital View LCD controller solutions for use by suitably qualified display system developers and integrators, the manufacturer accepts no liability for damage or injury caused by the use of this product. It is the responsibility of the developer, integrators or other user of this product to:

- Ensure that all necessary and appropriate safety measures are taken.
- Obtain suitable regulatory approvals as may be required.
- **Check power settings to all component parts before connection.**

### **DISCLAIMER**

There is no implied or expressed warranty regarding this material.

## Introduction

This document deals primarily with the command set available for the SVX family of LCD controllers. At the time of writing this includes the SVX-1920, SVX-1920-SDI, SGX-1920, SGX-1920L.

The commands can be used from a terminal program on a PC, for example HyperTerminal for Windows; from a programmed device such as a Crestron or AMX controller; custom hardware, for example a button board with a small processor to give dedicated commands such as input port selection; or from a custom written application running on a PC such as the Digital View Controller Utility, free at <http://www.digitalview.com/software-services>.

**The cable and connection requirements are:**

*Settings:*

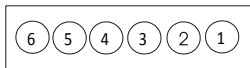
RS-232 default settings: Baud rate 2400, 8 bits, 1 stop bit and no parity

**Note:** A baud rate of 38400 is possible with custom controller firmware, contact Digital View for details.

*Cable:*

**Controller side**

Connector interface : CN8  
Mating connector : JST XHP-6

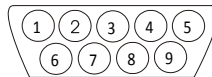


Mating face of CN8

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

**Computer side**

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
5	Ground

Remark :

(1) : RS-232 connection cable, 600mm P/N 4260902-00 can be ordered separately for connection.

*Software:*

A RS-232 program can be custom designed for a specific application or the commands can be used with a serial control program, like HyperTerminal.

## RS-232 Commands Summary

The RS-232 command groups can be summarized as follows:

- OSD buttons
- General settings
- On-Screen-Display (OSD) related
- Input signal selection
- Input signal data
- Hardware settings & Data
- Picture in Picture (PiP) functions
- Image Zoom & Position
- Color Temperature functions
- Gamma correction functions
- Backlight functions
- On-screen markers
- Displaymark integration functions
- Ethernet input settings
- Text overlay

<b>OSD Buttons:</b> Commands to replicate 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

<b>General Settings</b>			
Function	Command	Description	Acknowledge (if enabled)
Volume control - left+right channel	0x80, "a"   "A", nn   "+"   "-"   "r"   "R"   "?"	Set audio (L+R) volume = value/increment/decrement Reset Query	volume  Range : "0"0-"1"E" Default : "0"F"
Volume control - on/off (mute)	0x80, "m"   "M", "0"   "1"   "r"   "R"   "?"	Disable audio output. Enable audio output. Reset Query	"0" - audio off (muted). "1" - audio on.
Brightness control	0x81, nn   "+"   "-"   "r"   "R"   "?" "m" "n" "i", ss, nn "o", ss,	Set brightness = value/increment/decrement Reset Query Current Source Maximum query *1 Minimum query *1 Set, Source, value *1 Query, Source *1	Brightness.  Range : "4"E-"B"2" Default : "8"0"  ss - reference by Input main select(0x98)
Contrast control - all channels	0x82, "a"   "A", nn   "+"   "-"   "r"   "R"   "?" "m" "n" "i", ss, nn "o", ss,	Set all contrast = value/increment/decrement Reset Query Maximum query *1 Minimum query *1 Set, Source, value *1 Query, Source *1	Contrast  Range : "1"C-"E"4" Default : "8"0"  ss - reference by Input main select(0x98)
Saturation control	0x83, nn   "+"   "-"   "r"   "R"   "?" "m" "n" "i", ss, nn "o", ss,	Set color = value/increment/decrement Reset Query Maximum query *1 Minimum query *1 Set, Source, value *1 Query, Source *1	PAL/NTSC color (In video mode only )  Range : "0"1-"F"F" Default : "8"0"  ss - reference by Input main select(0x98)
Hue control	0x84, nn   "+"   "-"   "r"   "R"   "?" "m" "n" "i", ss, nn "o", ss,	Set tint = value/increment/decrement Reset Query Maximum query *1 Minimum query *1 Set, Source, value *1 Query, Source *1	NTSC tint (In NTSC mode only)  Range : "5"3-"9"F" Default : "7"9"  ss - reference by Input main select(0x98)
Phase (tuning) control	0x85, nn   "+"   "-"   "?"	Set dot clock phase = value/increment/decrement Query	Dot clock phase. (In PC mode only)
Image H position	0x86,	Set img_hpos =	Image horizontal position.

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	nnnn   "+"   "-"   "?"	value/increment/decrement Query	(In PC mode only)
Image V position	0x87, nnnn   "+"   "-"   "?"	Set img_vpos = value/increment/decrement Query	Image vertical position. (In PC mode only)
Sharpness	0x8a, nn   "+"   "-"   "r"   "R"   "?"	Set sharpness = value/increment/decrement Reset Query	Sharpness. (Video Mode Source only) Range : "F"4-"0"0"C" Default : "0"0"
Frequency	0x8b, nnnn   "+"   "-"   "?"	Set frequency = Value/increment/decrement Query	Graphic mode H active size (in pixels)
Scaling Mode	0x8c, "0"   "1"   "2"   "3"   "9"   "A"   "B"   "C"   "D"   "r"   "R"   "?"	Set graphic image scaling mode = value Reset Query	Image expansion on/off. "0" – 1:1 "1" – fill screen "2" – fill to aspect ratio "9" – 4:3 "A" – 16:9 "B" – 16:10 "C" – 2.35:1 "D" – 2:1

**OSD Related:** Commands related to the On-Screen-Display

Function	Command	Description	Acknowledge (if enabled)
OSD status enquiry	0xbb	Status of OSD	"0" – OSD turned off "1" – OSD turned on "2" – Text Overlay on "3" – Display Mark on "4" – Screen Marker on
OSD turn off	0xbd	Turn off the OSD.	"0" – fail. "1" – successful.
OSD H position	0x90, nnn   "+"   "-"   "r"   "R"   "?"	Set osd_hpos = value/increment/decrement Reset Query	OSD horizontal position.  Range : "0"00-"F"FF Default : "8"00"
OSD V position	0x91, nnn   "+"   "-"   "r"   "R"   "?"	Set osd_vpos = value/increment/decrement Reset Query	OSD vertical position.  Range : "0"00-"F"FF Default : "8"00"
OSD Transparency	0x92, n   "+"   "-"   "r"   "R"   "?"	Set OSD transparency = value/increment/decrement Reset Query	OSD transparency.  "0" – ON "1" – OFF
OSD menu timeout	0x93, nn   "+"   "-"   "r"   "R"   "?"	Select menu timeout = value/increment/decrement Reset Query	OSD menu timeout value. "0"00 – Continuous. value – Round up to nearest available step. if value > max available step, set it to the max available step. Range : "0"55-"3"0C" Default : "0"0A"
Select OSD language	0x95, n   "r"   "R"   "?"	Select language = English, Chinese,... Reset Query	"0" – English. "2" – French "3" – Spanish "6" – German "8" – Chinese

**Input Signal Selection**

Function	Command	Description	Acknowledge (if enabled)
Input main select	0x98,	Select input main =	Main selected.

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RS-232 Control Protocols for the SVX Controller Family

	nn   "+"   "-"   "r"   "R"   "?"	PC or VIDEO or next available Reset Query	"0x41,0x31" ARGB "0x42,0x31" Composite "0x42,0x32" Composite2 "0x43,0x31" S-video "0x43,0x32" S-video2 "0x44,0x31" Component "0x44,0x32" Component2 "0x45,0x31" HDS DI "0x45,0x32" HDS DI2 "0x46,0x31" DVI "0x48,0x31" HDMI
Auto Source Seek	0x99, nn , "0"   "1"   "?"   "o"	Set Auto source enable = *1 Source Disable/ Enable Query Valid Source query	"nn" = "0x41,0x31"- ARGB "0x42,0x31"- Composite "0x42,0x32"- Composite 2 "0x43,0x31"- S-video "0x43,0x32"- S-video 2 "0x44,0x31"- Component "0x44,0x32"- Component 2 "0x45,0x31"- HDS DI "0x45,0x32"- HDS DI2 "0x46,0x31"- DVI "0x48,0x31" HDMI
Source Layout	0x9a, n   "r"   "R"   "?"	Select source layout = Single, PIP, PBP, PBPT Reset, Query	Query: "0"- Single "1"- Picture in Picture (PIP) "2"- Picture by Picture (PBP) "3"- Picture by Picture Tall (PBPT) "F" – Turn ON PIP Window***
Video System (Composite, S- video and Component Only)	0x9b, "0"   "1"   "2"   "3"   "r"   "R"   "S"   "s"   "?"	Set video system = Auto/NTSC/PAL/SECAM Reset Video State Query Query	Query "0" – Auto. "1" – NTSC_M_358 "2" – PAL_N_443 "3" – SECAM "4" – NTSC_M_443 "5" - PAL_M_358 "7" – PAL_M_443 "9" – PAL_N_358 <hr/> Video State Query "0" – No video. "1" – NTSC "2" – PAL "3" – SECAM "4" – NTSC 443 "5" – PAL M 358

Input Signal Data			
Function	Command	Description	Acknowledge (if enabled)
Graphic horizontal resolution enquiry	0xb7	Horizontal resolution (in pixels) in 3 digit hex number	"nnn" = horizontal resolution
Graphic vertical resolution enquiry	0xb8	Vertical resolution (in lines) in 3 digit hex number	"nnn" = vertical resolution
Graphic horizontal sync frequency enquiry	0xb9	Horizontal sync frequency (in units of 100Hz) in 3 digit hex number	"nnn" = horizontal frequency
Graphic vertical	0xba	Vertical sync frequency (in units	"nnnn" = vertical frequency

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sync frequency enquiry		of Hz) in 3 digit hex number and 1 char	nnn = 3 digit hex c= "i" or "p" interlace or Progressive  0xba added the interlace(i) or Progressive(p) feedback.
Display Video Source Select	0xbc, "?"   "0"   "1"	Display Video source select Query Name of video source not displayed. After switching to a new video source, the name of the video source is displayed for 5 seconds.	"0" – Disabled. "1" – Enabled.

Hardware Settings & Query			
Function	Command	Description	Acknowledge (if enabled)
Auto power off	0x9f, "0"   "1"   "r"   "R"   "?"	Set power down option = On/Off Reset Query	"0" – Off. "1" – On.
Hotkey 1	0xa0, "1", n   "r"   "R"   "?"	Set Hotkey 1= Value Reset Query	"1" – volume. "2" – brightness. "3" – contrast. "4" – colour. "5" – input source. "7" – zoom "8" – freeze "9" – PIP "B" – No function "D" – PIP Swap "E" – Aspect Ratio "G" – Hue "H" – Backlight "I" – Auto Picture Setup "K" – PIP ON/OFF***
Hotkey 2	0xa0, "2", n   "r"   "R"   "?"	Set Hotkey 2 = value Reset Query	"1" – volume. "2" – brightness. "3" – contrast. "4" – colour. "5" – input source. "7" – zoom "8" – freeze "9" – PIP "B" – No function "D" – PIP Swap "E" – Aspect Ratio "G" – Hue "H" – Backlight "I" – Auto Picture Setup "K" – PIP ON/OFF***
Runtime counter	0xa1, nnnn   "r"   "R"   "?"	runtime counter value = nnnn (* 0.5 hour) Reset Query	Runtime = nnnn.
Query External Memory	0xcb, "2"	Check External Memory 24c256	"0" – Not Installed "1" – Installed "?" – Not Support
Query Revision Number	0xcb, "3"	Read Revision Number	"nn" = Revision number

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IR Lock*	"0xee", "0x48" n   "0"   "1"   "r"   "R"   "?"	IR Lock Disable / IR Lock Enable Reset Query	"0" – IR Lock Disable "1" – IR Lock Enable
Light Detector	"0xee", "0x4A" "0"   "1"   "R"   "r" "?" "S"   "s"	Light Detector Off / Light Detector On Light Detector On/Off Query Light Detector Value Query	"0" –Light Detector Off "1" –Light Detector On. "?" – Light Detector On/Off Query "S" "s" –Light Detector Value Query 0x00~0xFF
Display real time clock**	"0xee", "0x4D" "0"   "1"	Real Time Clock Display Off / Real Time Clock Display	"0"- Off "1"- On
Custom Sizing	0xef, "0"   "1"   "2" "?"	Custom sizing selection : Overscan / Normal / Custom Query	"0" – Overscan "1" – Custom / Underscan "2" – Normal
Select RS-232 acknowledge	0xc1, "0"   "1"   "2"   "3"	Disable/enable command acknowledge.	"0" – acknowledge disabled. "1" – acknowledge enabled. "2" – serial command disabled. "3" – serial command enabled.
Auto-setup	0xc3	Start auto-setup of current vmode.	"0" – fail. "1" – successful.
Command availability	0xc4, n	Check whether a command is available.	"0" – not available. "1" – available.
Auto-calibration	0xc5	Start auto-calibration of gain of the RGB amplifier.	"0" – fail. "1" – successful.
Freeze frame	0xc6, "0"   "1"	Unfreeze / freeze frame	"0" – unfreeze. "1" – freeze.
Soft Power On/Off	0xc8, "0"   "1"   "?"	Soft power off/on query	"0" – Turn off the LCD power and backlight. Turn off memory controller, Power down DVI Power down ADC, Power down Fclk PLL "1" – Turn on the unit
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 "A", "1" ARGB "B", "1" Composite "B", "2" Composite 2 "C", "1" S-video "C", "2" S-video 2 "D", "1" Component "D", "2" Component 2 "E", "1" HDS DI "E", "2" HDS DI 2 "F", "1" DVI "H", "1" HDMI  "xx,nn"= PIP input status: "0", "0": invalid "A", "1" ARGB "B", "1" Composite "B", "2" Composite 2 "C", "1" S-video "C", "2" S-video 2 "D", "1" Component "D", "2" Component 2 "E", "1" HDS DI "E", "2" HDS DI 2 "F", "1" DVI "H", "1" HDMI

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RS-232 Control Protocols for the SVX Controller Family

Video de-interlace method	0xca, "0"   "1" "r"   "R" "?"	De-interlace mode Reset Query	"3" "1" - enable AFM "3" "0" - disable AFM "4" "1" - enable TNR "4" "0" - disable TNR "5" "1" - enable MADI "5" "0" - disable MADI "7" "1" - enable DCDi "7" "0" - disable DCDi
Query BIOS version	0xcb, "0"	Read BIOS version	BIOS version "VV.YY.ZZ" VV = V0 or E0, V0 = Release version E0 = Engineering Sample  YY= Version Number  ZZ= Customer Number
Query PCBA number	0xcb, "1"	Read PCBA number	"nnnnn" = PCBA number SVX-1920= "41721"
Reset to Factory Defaults	0xce	Reset all parameters to default value	"1" - successful.
Reset to Factory Defaults with (color temp)	0xcf	Reset all parameters for all video modes to default value	"1" - successful.
Saved Calibrated default	0xd7	Saving all parameters to user default value	"1" - successful.
Load Calibrated default	0xd8	Loading all parameters to user default value	"1" - successful. "0" - not successful "E" - Checksum Error
Wide Screen Mode Selection	0xd9, "0"   "1"   "2" "r"   "R" "?"	Wide Screen Mode Reset Query	"0" - Normal Mode "1" - 1280x768 "2" - 1366x768

Picture-in-Picture (PIP) Functions			
Function	Command	Description	Acknowledge (if enabled)
PIP brightness control	0xa2, nn   "+"   "-"   "r"   "R"   "?"	Set PIP window brightness = value/increment/decrement Reset Query	PIP window brightness.  Range : "4" "E" - "B" "2" Default : "8" "0"
PIP contrast control	0xa3, nn   "+"   "-"   "r"   "R"   "?"	Set PIP window contrast = value/increment/decrement Reset Query	PIP window contrast.  Range : "1" "C" - "E" "4" Default : "8" "0"
PIP H position	0xa4, nnn   "+"   "-"   "r"   "R"   "?"	Set PIP_hpos = value/increment/decrement Reset Query	PIP window horizontal position.  Range : "0" "0" "0" - "0" "6" "4" Default : "0" "5" "5"
PIP V position	0xa5, nnn   "+"   "-"   "r"   "R"   "?"	Set PIP_vpos = value/increment/decrement Reset Query	PIP window vertical position.  Range : "0" "0" "0" - "0" "6" "4" Default : "0" "1" "4"
PIP window size select	0xa6, nn   "r"   "R"   "?"	Select PIP window size = PIP window size value Reset Query	Main selected. PIP off if "nn" = "0" "0". "0" "0" ~ "1" "2" "0" "0" ~ "1" "2" "1" "9" : Size by Size "1" "A" : Size by Size Tall
PIP source select	0xa7, n   "r"   "R"	Select input main = Video source value Reset	Main selected. 0x40 0x30 : PIP OFF 0x41, 0x31 : ARGB

Specifications subject to change without notice



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	"?"	Query	0x42, 0x31 : Composite 0x43, 0x31 : S-video 0x44, 0x31 : Component 1 0x45, 0x31 : HDSDI 1 0x46, 0x31 : DVI  0x42, 0x32 : Composite 2 0x43, 0x32 : S-video 2 0x44, 0x32 : Component 2 0x45, 0x32 : HDSDI 2  "0x48,0x31" HDMI
PIP Window Blend Level	0xed, nn   "+"   "-"   "R"   "r"   "?"	Select PIP Transparency Level PIP Transparency value Reset Query	PIP Transparency "0"F" = 6.25% "0"E" = 12.5% "0"D" = 18.75% "0"C" = 25% "0"B" = 31.25% "0"A" = 37.5% "0"9" = 43.75% "0"8" = 50% "0"7" = 56.25% "0"6" = 62.5% "0"5" = 68.75% "0"4" = 75% "0"3" = 81.25% "0"2" = 87.5% "0"1" = 93.75% "0"0" = 100%.
PIP Window Auto Off	"0xee", "0x41" "0"   "1" "?"	Auto Off / Auto On  Query	"0" - Off "1" - On
PIP Swap	0xe3	Swap Main and PIP source	"0" - Fail. "1" - Successful.

Image Zoom & Position			
Function	Command	Description	Acknowledge (if enabled)
Zoom level	0xa8, nnnn   "+"   "-"   "r"   "R"   "?"	Set Zoom level = value/increment/decrement Reset Query	Zoom level.  Min : 0x30 0x30 0x30 0x30 (Default) Max : 0x30 0x30 0x41 0x33
Zoom H position	0xa9, nnnn   "+"   "-"   "r"   "R"   "?"	Set Zoom_hpos = value/increment/decrement Reset Query	Zoom window horizontal position.  Default : 0x30 0x30 0x30 0x30 The min and max values will change depends on input resolution.
Zoom V position	0xaa, nnnn   "+"   "-"   "r"   "R"   "?"	Set Zoom_vpos = value/increment/decrement Reset Query	Zoom window vertical position.  Default : 0x30 0x30 0x30 0x30 The min and max values will change depends on input resolution.
Horizontal Size	0xad,  nnn   "+"   "-"   "r"   "R"   "?"	Set horizontal size for Aspect Size = value/increment/decrement Reset Query	Scalar horizontal stretch  PAL(576i) / NTSC (480i) : Min : 0x30 0x30 0x30 (Default) Max : 0x30 0x46 0x30
Vertical Size	0xb0,  nnn   "+"   "-"   "r"   "R"   "?"	Set Vertical Size for Aspect Size = value/increment/decrement Reset Query	Scalar vertical stretch.  PAL(576i) / NTSC (480i) : Min : 0x30 0x30 0x30 (Default) Max : 0x30 0x46 0x30
Horizontal Pan	0xb1,  nnn   "+"   "-"	Set horizontal pan position for Aspect Size = value/increment/decrement	Scalar horizontal pan position  PAL(576i) / NTSC (480i) :

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	"r"   "R"   "?"	Reset Query	Assume max H-Size & max V-size : Min : 0x46 0x38 0x38 Max : 0x30 0x37 0x38 Default : 0x30 0x30 0x30 The min and max values will change depends on different value of H-Size, V-Size and input resolution.
Vertical Pan	0xb2,  nnn   "+"   "-"   "r"   "R"   "?"	Set Vertical pan position for Aspect Size = value/increment/decrement Reset Query	Scalar vertical pan position  PAL(576i) / NTSC (480i) : Assume max H-Size & max V-size : Min : 0x46 0x38 0x38 Max : 0x30 0x37 0x38 Default : 0x30 0x30 0x30 The min and max values will change depends on different value of H-Size, V-Size and input resolution.

Color Temperature Functions			
Function	Command	Description	Acknowledge (if enabled)
Colour temperature select	0xb3,  n   "r"   "R"   "?"	Select colour temperature = value Reset Query	Main selected. "0" – 9500K. "1" – 8000K. "2" – 6500K. "3" – 5000K "4" - User
Red level for selected colour temperature	0xb4,  nn   "+"   "-"   "r"   "R"   "?" "m" "n" "i", ss, c, nn  "o", ss, c	Set the level of the red channel for the selected colour temp. = value/increment/decrement Reset Query Maximum query *1 Minimum query *1 Set, Source, Temperature Group, value *1 Query, Source *1	Red level for selected colour temperature.  Range : "9"C"- "F"F" Default : "E"C"  c – reference by Color Temperature ss - reference by Input main select(0x98)
Green level for selected colour temperature	0xb5,  nn   "+"   "-"   "r"   "R"   "?" "m" "n" "i", ss, c, nn  "o", ss, c	Set the level of the green channel for the selected colour temp. = value/increment/decrement Reset Query Maximum query *1 Minimum query *1 Set, Source, Temperature Group, value *1 Query, Source *1	Green level for selected colour temperature  Range : "9"C"- "F"F" Default : "E"C"  c – reference by Color Temperature ss - reference by Input main select(0x98).
Blue level for selected colour temperature	0xb6,  nn   "+"   "-"   "r"   "R"   "?" "m" "n" "i", ss, c, nn  "o", ss, c	Set the level of the blue channel for the selected colour temp. = value/increment/decrement Reset Query Maximum query *1 Minimum query *1 Set, Source, Temperature Group, value *1 Query, Source *1	Blue level for selected colour temperature.  Range : "9"C"- "F"F" Default : "E"C"  c – reference by Color Temperature ss - reference by Input main select(0x98).

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Red Offset for selected colour temperature	0xe8, nn   "+"   "-"   "r"   "R"   "?" "m" "n" "i", ss, c, nn  "o", ss, c	Set the Offset of the red channel for the selected colour temp. = value/increment/decrement Reset Query Maximum query *1 Minimum query *1 Set, Source, Temperature Group, value *1 Query, Source *1	Red Offset for selected colour temperature.  c – reference by Color Temperature ss - reference by Input main select(0x98)
Green Offset for selected colour temperature	0xe9, nn   "+"   "-"   "r"   "R"   "?" "m" "n" "i", ss, c, nn  "o", ss, c	Set the Offset of the green channel for the selected colour temp. = value/increment/decrement Reset Query Maximum query *1 Minimum query *1 Set, Source, Temperature Group, value *1 Query, Source *1	Green Offset for selected colour temperature.  c – reference by Color Temperature ss - reference by Input main select(0x98)
Blue Offset for selected colour temperature	0xea, nn   "+"   "-"   "r"   "R"   "?" "m" "n" "i", ss, c, nn  "o", ss, c	Set the Offset of the blue channel for the selected colour temp. = value/increment/decrement Reset Query Maximum query *1 Minimum query *1 Set, Source, Temperature Group, value *1 Query, Source *1	Blue Offset for selected colour temperature.  c – reference by Color Temperature ss - reference by Input main select(0x98)
Color Monochrome mode selection (Output Channel Select)	0xe2 "0"   "1"   "2"   "3"     "4"   "5"   "6"   "R"   "r"   "?"	Off/ Blue Only/ Red Only/ Green Only/ Blue Mono/ Red Mono/ Green Mono/	"0" – Off "1" – Blue Only "2" – Red Only "3" – Green Only "4" – Blue Mono "5" – Red Mono "6" – Green Mono

**Gamma Correction Settings**

Function	Command	Description	Acknowledge (if enabled)
GAMMA value select	0x9d, n   "r"   "R" "?"	Select GAMMA value = Value Reset Query	GAMMA value: "0" – 1.0, "1" – 1.6 "2" – 2.2, "3" – User Defined "4" – 1.7, "5" – 1.8, "6" – 1.9, "7" – 2.0, "8" – 2.1, "9" – 2.3, "A" – 2.4, "B" – 2.5, "C" – 2.6, "D" – 0.6, "E" – 0.7, "F" – 0.8, "G" – 0.9, "H" – 1.1, "I" – 1.2, "J" – 1.3, "K" – 1.4, "L" – 1.5
Set gamma data for user defined gamma curve	0xbf, mm, c, "?"  0xbf, "R"   "r" 0xbf, mm, c, nn	Query gamma data for color c index mm ( c = 0 for color Red, c=1 for color Green, c=2 for color Blue) Set user gamma curve to linear Set gamma data for color c	"nn" = gamma data  "1" "nn" = gamma data

Specifications subject to change without notice

		index mm. (If c= 3, then gamma data for red, green & blue will be set at the same time.)	
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<b>Backlight Functions</b>			
<b>Function</b>	<b>Command</b>	<b>Description</b>	<b>Acknowledge (if enabled)</b>
Backlight control	0xe0, nn   "+"   "-"   "R"   "r"   "?"	Set Backlight = value/increment/decrement Reset Query	Backlight. Range: D/A : "0" "0" ~ "1" "F" 100Hz : "0" "0" ~ "B" "F" 120Hz : "0" "0" ~ "9" "F" 140Hz : "0" "0" ~ "8" "8" 160Hz : "0" "0" ~ "7" "7" 180Hz : "0" "0" ~ "6" "A" 200Hz : "0" "0" ~ "5" "F" 220Hz : "0" "0" ~ "5" "6" 240Hz : "0" "0" ~ "4" "F" 260Hz : "0" "0" ~ "4" "9" 280Hz : "0" "0" ~ "4" "4" 300Hz : "0" "0" ~ "3" "F" 320Hz : "0" "0" ~ "3" "B" 340Hz : "0" "0" ~ "3" "7" 360Hz : "0" "0" ~ "3" "4" 380Hz : "0" "0" ~ "3" "1" 400Hz : "0" "0" ~ "2" "F" 420Hz : "0" "0" ~ "2" "D" 440Hz : "0" "0" ~ "2" "B"
Backlight On/Off	0xe1, "0"   "1"   "R"   "r" "?" "S"   "s"	Backlight Off / Backlight On /Status	"0" – Backlight Off "1" – Backlight On. "?" – Backlight On/Off Query "S" "s" – Backlight Status Query
Backlight D/A / PWM	0xe5 "0"   "1"   "R"   "r" "?"	Set : PWM or D/A  Reset Query	"0" – PWM "1" – D/A
Backlight PWM Frequency	0xe6, nnn   "+"   "-"   "R"   "r"   "?"	Set Backlight PWM Frequency = value/increment/decrement Reset Query	+/- 20Hz Value 100Hz : "0" ,"6" ,"4" 120Hz : "0" ,"7" ,"8" 140Hz : "0" ,"8" ,"C" 160Hz : "0" ,"A" ,"0" 180Hz : "0" ,"B" ,"4" 200Hz : "0" ,"C" ,"8" 220Hz : "0" ,"D" ,"C" 240Hz : "0" ,"E" ,"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 On or Off  Reset Query	"0" – Off "1" – On

<b>On Screen Markers</b>			
<b>Function</b>	<b>Command</b>	<b>Description</b>	<b>Acknowledge (if enabled)</b>
ScreenMarker	"0xee", "0x42" "0"   "1"	Screen Marker Off / Screen Marker On	"0"- Off "1"- On
CenterMarker	"0xee", "0x43" "0"   "1"	Center Marker Off / Center Marker On	"0"- Off "1"- On
AspectMarker	"0xee", "0x44" "0"   "1"	Preliminary 4:3 /16:9	"0"- 4:3 "1"- 16:9
Marker Background Transparency	"0xee", "0x45" "0"   "1"   "2"   "3"	Preliminary 0% /25%/50%/95%	"0"- 0% "1"- 25% "2"- 50% "3"- 95%
Safe Area Marker*	"0xee", "0x47" "0x53"~"0x63"	Preliminary 80%~99%	"36", "33"- 99% "36", "32"- 98% "36", "31"- 97% "36", "30"- 96% "35", "46"- 95% "35", "45"- 94% "35", "44"- 93% "35", "43"- 92% "35", "42"- 91% "35", "41"- 90% "35", "39"- 89% "35", "38"- 88% "35", "37"- 87% "35", "36"- 86% "35", "35"- 85% "35", "34"- 84% "35", "33"- 83% "35", "32"- 82% "35", "31"- 81% "35", "30"- 80%
Safe Area Marker Enable	"0xee", "0x4B" "0"   "1"	Safe Area Marker Off / Safe Area Marker On	"0"- Off "1"- On
Aspect Marker Enable	"0xee", "0x4C" "0"   "1"	Aspect Marker Off / Aspect Marker On	"0"- Off "1"- On
ScreenMarker	"0xee", "0x42" "0"   "1"	Screen Marker Off / Screen Marker On	"0"- Off "1"- On
CenterMarker	"0xee", "0x43" "0"   "1"	Center Marker Off / Center Marker On	"0"- Off "1"- On
AspectMarker	"0xee", "0x44" "0"   "1"	Preliminary 4:3 /16:9	"0"- 4:3 "1"- 16:9
Marker Background Transparency	"0xee", "0x45" "0"   "1"   "2"   "3"	Preliminary 0% /25%/50%/95%	"0"- 0% "1"- 25% "2"- 50% "3"- 95%
Safe Area Marker	"0xee", "0x46" "0x53"~"0x63"	Preliminary 64%~98%	"36", "33"- 98% "36", "32"- 96% "36", "31"- 94% "36", "30"- 92% "35", "46"- 90% "35", "45"- 88% "35", "44"- 86% "35", "43"- 84%

Specifications subject to change without notice

RS-232 Control Protocols for the SVX Controller Family

			"35", "42"- 83% "35", "41"- 81% "35", "39"- 79% "35", "38"- 77% "35", "37"- 76% "35", "36"- 74% "35", "35"- 72% "35", "34"- 71% "35", "33"- 69% "35", "32"- 67% "35", "31"- 66% "35", "30"- 64%
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<b>DisplayMark Functions:</b> DisplayMark is an add-on board for monitoring the display condition			
Function	Command	Description	Acknowledge (if enabled)
Send Display Mark	0xF1, "S"   "0x21"   "0x40" "0x60"   "0x7E" Return "1"	"S" = "0x53 or 0x73" ASCII "0x21,0x40,0x60,0x7E"  Return "0x31"	"S" – Send Command "Text" – Character  "1" - successful.
e.g Send Display Mark RS232 Code: "0xF1 0x53 0x21" Return Code: "0xF1 0x53 0x21 0x31"			
Clear Display Mark	0xF1, "C" Return "1"	"C" = "0x43 or 0x63" Return "0x31"	"C" – Clear command "1" - successful.
e.g Clear Display Mark RS232 Code: "0xF1 0x43" Return Code: "0xF1 0x43 0x31"			
Display Mark Horizontal Position	0xF1,  "H"  "ss"  Return "nn"	"H" = "0x48 or 0x68" ----- "nn" = "0x30,0x30~0x46,0x46"	"H" – Horizontal Position command "ss" – Set Horizontal Position number "nn" – Return Position number
e.g Set Display Mark Horizontal Position RS232 Code: "0xF1 0x48 0x30 0x31" Return Code: "0xF1 0x48 0x30 0x31 0x30 0x31"			
Display Mark Vertical Position	0xF1,  "V"  "ss"  Return "nn"	"V" = "0x56 or 0x76" ----- "nn" = "0x30,0x30~0x46,0x46"	"V" – Vertical Position command "ss" – Set Vertical Position number "nn" – Return Position number
e.g Set Display Mark Vertical Position RS232 Code: "0xF1 0x56 0x30 0x31" Return Code: "0xF1 0x56 0x30 0x31 0x30 0x31"			
Display Mark Background Transparency	0xF1,  "B" "N"  Return "n"	"B" = "0x42 or 0x62" Set Transparency command ----- "N" = "0x30~0x46" Transparency Value (Rang 00~0F)	"B" - Transparency command "N" – Transparency Value "n" - Return Value  0x00 =opaque
Set Display Mark background Transparency value is 8 RS232 Code: "0xF1 0x42 0x38" Return Code: "0xF1 0x42 0x38 0x38"			
Send Display Mark	0xF1, "S"   "0x21"   "0x40" "0x60"   "0x7E" "0x22"   "0x42" #	"S" = "0x53 or 0x73" ASCII "0x21,0x40, 0x60,0x7E 0x22, 0x42" #	"S" – Send Command 0x21 : Full size cell black block 0x40 : Full size cell white block 0x22 : 1/2 cell black block

Specifications subject to change without notice

RS-232 Control Protocols for the SVX Controller Family

	"0x23"   "0x43" # Return "1"	0x23, 0x43" # Return " 0x31"	vertical size # 0x42 : 1/2 cell white block vertical size # 0x23 : 8 x 8 triangle (BLACK) # 0x43 : 8 x 8 triangle (WHITE) # "1" - successful.
e.g Send Display Mark RS232 Code: "0xF1 0x53 0x21" Return Code: "0xF1 0x53 0x21 0x31"			
Send Display Mark	0xF1, "S"   "0x21"   "0x40" "0x60"   "0x7E" Return "1"	"S" = "0x53 or 0x73" ASCII "0x21,0x40,0x60,0x7E"  Return " 0x31"	"S" – Send Command "Text" – Character  "1" - successful.
e.g Send Display Mark RS232 Code: "0xF1 0x53 0x21" Return Code: "0xF1 0x53 0x21 0x31"			
Clear Display Mark	0xF1, "C" Return "1"	"C" = "0x43 or 0x63" Return " 0x31"	"C" – Clear command "1" - successful.
e.g Clear Display Mark RS232 Code: "0xF1 0x43" Return Code: "0xF1 0x43 0x31"			
Display Mark Horizontal Position	0xF1,  "H"  "ss"  Return "nn"	"H" = "0x48 or 0x68" ----- --"nn" = "0x30,0x30~0x46,0x46"	"H" – Horizontal Position command "ss" – Set Horizontal Position number "nn" – Return Position number
e.g Set Display Mark Horizontal Position RS232 Code: "0xF1 0x48 0x30 0x31" Return Code: "0xF1 0x48 0x30 0x31 0x30 0x31"			
Display Mark Vertical Position	0xF1,  "V"  "ss"  Return "nn"	"V" = "0x56 or 0x76" ----- --"nn" = "0x30,0x30~0x46,0x46"	"V" – Vertical Position command "ss" – Set Vertical Position number "nn" – Return Position number
e.g Set Display Mark Vertical Position RS232 Code: "0xF1 0x56 0x30 0x31" Return Code: "0xF1 0x56 0x30 0x31 0x30 0x31"			
Display Mark Background Transparency	0xF1,  "B" "N"  Return "n"	"B" = "0x42 or 0x62" Set Transparency command ----- "N" = "0x30~0x46" Transparency Value (Rang 00~0F)	"B" - Transparency command "N" – Transparency Value "n" - Return Value  0x00 =opaque
Set Display Mark background Transparency value is 8 RS232 Code: "0xF1 0x42 0x38" Return Code: "0xF1 0x42 0x38 0x38"			
Bi-directional communication between Display Mark and IP50 #	"0xee", "0x64" "0x7B"  "TEXT"  "0x7D" Return "1"	Send command Start Text Command "TEXT" End of Text Command return to CN8 only	"0xee 0x64" – Send Command "0x7B" – Start of Text "Text" – Character (ASCII format) "0x7D" – End of Text "1" - successful. (return from CN8)

Specifications subject to change without notice

**RS-232 Control Protocols for the SVX Controller Family**

<p>Display Mark Connect with CN8:                  Send Code from <b>Display Mark</b>:                  0xEE 0x64 <b>0x7B</b> 0x4C 0x58 0x3D 0x30 0x0D 0x0A 0x49 0x66 0x20 0x6E 0x6F 0x74 0x20 0x3E 0x33 0x30  <b>0x7D</b></p> <p>Return Code to <b>Display Mark</b>:                  0xEE 0x64 <b>0x7B</b> 0x4C 0x58 0x3D 0x30 0x0D 0x0A 0x49 0x66 0x20 0x6E 0x6F 0x74 0x20 0x3E 0x33 0x30  <b>0x7D</b> 0x31</p> <p><b>IP50</b> Receive code:  <b>0x7B</b> 0x4C 0x58 0x3D 0x30 0x0D 0x0A 0x49 0x66 0x20 0x6E 0x6F 0x74 0x20 0x3E 0x33 0x30 <b>0x7D</b></p> <hr/> <p>Display Mark Connect with CN8:                  Send Code from <b>IP50</b>:                  0xEE 0x64 <b>0x7B</b> 0x4C 0x58 0x3D 0x30 0x0D 0x0A 0x49 0x66 0x20 0x6E 0x6F 0x74 0x20 0x3E 0x33 0x30  <b>0x7D</b></p> <p>Return Code to <b>IP50</b>:                  0xEE 0x64 <b>0x7B</b> 0x4C 0x58 0x3D 0x30 0x0D 0x0A 0x49 0x66 0x20 0x6E 0x6F 0x74 0x20 0x3E 0x33 0x30  <b>0x7D</b> 0x31</p> <p><b>Display Mark</b> Receive code:  <b>0x7B</b> 0x4C 0x58 0x3D 0x30 0x0D 0x0A 0x49 0x66 0x20 0x6E 0x6F 0x74 0x20 0x3E 0x33 0x30 <b>0x7D</b></p>
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# - Effective on V0.45.00.01 or later revision.

<b>Ethernet Input Settings:</b> SVX family controllers feature Ethernet connection for control similar to RS-232			
Function	Command	Description	Acknowledge (if enabled)
Static IP or DHCP mode switching***	"0xee", "0x70" "A"0"   "A"1"	Select Static IP or DHCP mode	Static IP: 0xee 0x70 0x41 0x30 DHCP : 0xee 0x70 0x41 0x31

<b>Text Overlay:</b> Put messages on the screen			
Function	Command	Description	Acknowledge (if enabled)
Send Line	0xF0,  "S"  "LL" "TEXT"  "0x0A" Return "1"	"S" = "0x53 or 0x73" Send command ----- - "LL" = "0x30,0x31~0x30,0x34" Line number (Rang 0~4 lines) ----- - "Text"= ASCII code, "0x20~0x7E" Character( Rang 0~34 ) ----- - 0x0A = End of line	"S" – Send Command "LL" – Line Number "Text" – Character "0x0A" – End of Line "1" - successful.
e.g Display "Send Text" message on screen: RS232 Code:"0xF0 0x53 0x30 0x31 0x53 0x65 0x6E 0x64 0x20 0x54 0x65 0x78 0x74 0x0A" Return Code: "0xF0 0x53 0x30 0x31 0x53 0x65 0x6E 0x64 0x20 0x54 0x65 0x78 0x74 0x0A 0x31"			
Clear Line	0xF0,  "C"  "LL"  Return "nn"	"C" = "0x43 or 0x63" Clear command ----- - "LL" = "0x30,0x31~0x30,0x34" Line number (Rang 0~4 lines)	"C" – Clear command "LL" – Line Number "nn" – Return Line number



**RS-232 Control Protocols for the SVX Controller Family**

e.g Clear Line 1 RS232 Code: "0xF0 0x43 0x30 0x31" Return Code: "0xF0 0x43 0x30 0x31 0x30 0x31"			
Text Window Horizontal Position	0xF0,  "H" "ss"  Return "nn"	"H" = "0x48 or 0x68" ----- --"nn" = "0x30,0x30~0x46,0x46"	"H" – Horizontal Position command "ss" – Set Horizontal Position number "nn" – Return Position number
e.g Set Text Window Horizontal Position RS232 Code: "0xF0 0x48 0x30 0x31" Return Code: "0xF0 0x48 0x30 0x31 0x30 0x31"			
Text Window Vertical Position	0xF0,  "V" "ss"  Return "nn"	"V" = "0x56 or 0x76" ----- --"nn" = "0x30,0x30~0x46,0x46"	"V" – Vertical Position command "ss" – Set Vertical Position number "nn" – Return Position number
e.g Set Text Window Vertical Position RS232 Code: "0xF0 0x56 0x30 0x31" Return Code: "0xF0 0x56 0x30 0x31 0x30 0x31"			
Left offset	0xF0,  "O" "SSS"  Return "nnn"	"O" = "0x4F or 0x6F" Set Left Offset command ----- - "SSS" = "0x30,0x30,0x30~ 0x33,0x46,0x46" Offset Value (Rang 000~3ff)	"O" – Left Offset Command "SSS"- Offset Value (pixels) "nnn"- Return Value(pixels)
e.g Set Left Offset = 100 pixels ( 0x64 (HEX)) RS232 Code: "0xF0 0x4F 0x30 0x36 0x34" Return Code: "0xF0 0x4F 0x30 0x36 0x34 0x30 0x36 0x34"			
Text Window Horizontal Size	0xF0,  "X" "SSS"  Return "nnn"	"X" = "0x58" Set Horizontal Size command ----- - "SSS" = "0x31,0x45,0x30~ 0x37,0x38,0x30" Horizontal Size Value (Rang 000~3ff)	"X" –Horizontal Size "SSS"- Size Value (pixels) "nnn"- Return Value(pixels)
e.g Set Text Window Horizontal Size = 640 pixels ( 0x280 (HEX)) RS232 Code: "0xF0 0x58 0x32 0x38 0x30" Return Code: "0xF0 0x58 0x32 0x38 0x30 0x32 0x38 0x30"			
Background Transparency	0xF0,  "B" "N"  Return "n"	"B" = "0x42 or 0x62" Set Transparency command ----- "N" = "0x30~0x46" Transparency Value (Rang 00~0F)	"B" - Transparency command "N" – Transparency Value "n" - Return Value  0x00 =opaque
Set background Transparency value is 8 RS232 Code: "0xF0 0x42 0x38" Return Code: "0xF0 0x42 0x38 0x38"			
Text Overlay Background On or Off	0xF0,  "Q"  "N"	"Q" = "0x51 or 0x71" Set Background Enable or Disable -----	"B" - command "1" Turn On Text Overlay Background

Specifications subject to change without notice

## RS-232 Control Protocols for the SVX Controller Family

	Return "n"	"N" = "0x30~0x31"	"0" Turn Off Text Overlay Background "n" - Return Value
Set background Transparency value is 8 RS232 Code: "0xF0 0x51 0x31" Return Code: "0xF0 0x51 0x31 0x31"			
Please set the "Background Transparency" and "Left offset" commands before the "Send Line" command.			

### Notes:

- \* Effective in V0.27.00 or up firmware revision.
- \*\* Effective in V0.33.00 or up firmware revision
- \*\*\* Effective in V0.50.00.00 or up firmware revision

## Command String Size Limits and HEX table

The RS-232 command strings up to 380 bytes can be sent through CN8 port  
 The RS-232 command string up to 50 bytes can be sent through 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 below.

Hex to ASCII conversion table

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		

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## WARRANTY

The products are warranted against defects in workmanship and material for a period of three (3) year from the date of purchase provided no modifications are made to it and it is operated under normal conditions and in compliance with the instruction manual.

The warranty does not apply to:

- Product that has been installed incorrectly, this specifically includes but is not limited to cases where electrical short circuit is caused.
- Product that has been altered or repaired except by the manufacturer (or with the manufacturer's consent).
- Product that has subjected to misuse, accidents, abuse, negligence or unusual stress whether physical or electrical.
- Ordinary wear and tear.

Except for the above express warranties, the manufacturer disclaims all warranties on products furnished hereunder, including all implied warranties of merchantability and fitness for a particular application or purpose. The stated express warranties are in lieu of all obligations or liabilities on the part of the manufacturer for damages, including but not limited to special, indirect consequential damages arising out of or in connection with the use of or performance of the products.

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## CAUTION

Whilst care has been taken to provide as much detail as possible for use of this product it cannot be relied upon as an exhaustive source of information. This product is for use by suitably qualified persons who understand the nature of the work they are doing and are able to take suitable precautions and design and produce a product that is safe and meets regulatory requirements.

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## LIMITATION OF LIABILITY

The manufacturer's liability for damages to customer or others resulting from the use of any product supplied hereunder shall in no event exceed the purchase price of said product.

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