

## **Datavideo SE-1200 RS-232 Control Protocol**

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## 1. Introduction

This document describes the SE-1200 Serial Control Protocol

- Used to communicate between the SE-1200MU and an external controller, such as a PC or automation system
- The protocol is based on the well-known GVG100 Protocol, in order to allow for maximum compatibility with existing control systems & software.
- However, the serial port on the SE-1200MU is RS232, and runs at 19.2k baud, so this needs to be taken into account by any external control system
- Also, the standard 'Break' character is not needed with this implementation of the interface
- The protocol is extended to allow the SE-1200MU Menu system to be accessed.
- The protocol extensions Get & Set Controls allow any of the SE-1200 control parameters to be accessed

## Serial Interface

The Serial Control Protocol Control is available on the RS232 serial port connector.

## **Interface Format**

RS-232, 8 bit DATA, 1 STOP bit, ODD parity, 19.2k baud

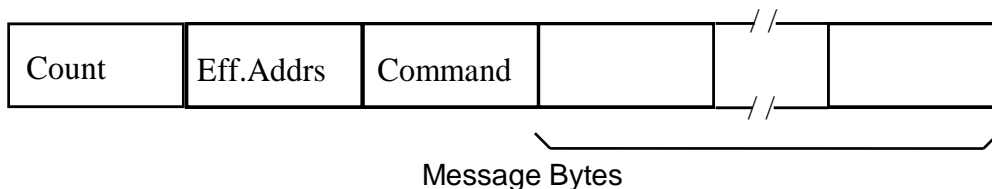
## Protocol Description

### **Command Format**

The commands are based upon the well-known GVG100 Protocol.

Unless shown as a value, the effects address, EX, may take any value from 0x00 to 0xFF.

All messages conform to the following format,



**Figure 1 Command Format**

- *Count* is the command byte-count
- *Eff. Addr* is the effects address byte
- *Command* is the command code byte.

### ○ Response Format

A read command is responded to by returning the corresponding write command with the data. E.g. if the SE-1200 Wipe Pattern is set for a vertical wipe, a read wipe pattern command (0x02 0x01 0x48) would be answered with 0x03 0x01 0xC8 0x02.

A write command is answered with a two byte status message. The first byte is the byte count (01), and the second byte indicates the status, as shown in Figure 2.

Response	Byte Count	Status Byte
Command Accepted	0x01	0x80
Command Error	0x01	0x40

**Figure 2 Response Format**

### ○ Message Commands

The following commands are defined:

Comand Name	Read/Write Code (Hex)	Section	Page
Crosspoint – Program	41 / C1	0	3
Crosspoint – Preset	42 / C2	0	3
Crosspoint – Key Fill Src	43 / C3	0	3
Crosspoint – Key Key Src	44 / C4	0	3
Analog Control	45 / C5	0	4
Pushbutton / Lamp On	- - / C6	0	5
Pushbutton / Lamp Off	- - / C7	0	5
Lamp Read	46, 47 / - -	0	5
Wipe Pattern	48 / C8	0	8
Transition Mode	4A / CA	0	9
Transition Rate - Auto Trans	4C / CC	0	9
Transition Rate - DSK Trans	4D / CD	0	9
Crosspoint Remap	60 / E0	0	12
Store User Memory	- - / DA	0	11
Load User Memory	- - / DB	0	11
Menu Select	- - / DE	0	12
Status Update	6E / EE	0	13
Get & Set Control Commands	70 / F0	0	14
All Stop	- - / F2	0	錯誤! 尚未定義書籤。
Push Button Select	- - / FB	0	14
Transition Rate - FTB Trans	7D / FD	0	9

**Table 1 Message Commands**

## CROSSPOINT (41, 42, 43, 44 / C1, C2, C3, C4)

Function	Byte Count	Effects Address	Command Code (Hex)	Message
Read Program	02	EX	41	-
Read Preset	02	EX	42	-
Read Key Fill Src	02	EX	43	-
Read Key Key Src	02	EX	44	-
Write Program	03	EX	C1	Crosspoint
Write Preset	03	EX	C2	Crosspoint
Write Key Fill Src	03	EX	C3	Crosspoint
Write Key Key Src	03	EX	C4	Crosspoint

The **Write Command** enables allocation of one of the available 'sources' to the designated bus.

The **Read Command** returns the source currently selected in the form of the corresponding **Write Command**.

The **Effects Address** is used to select Keyer (Key1, Key2, DSK1, DSK2):

Effects Addr (EX)	SE-1200 Mode
00	Key 1
01	Key 2
02	DSK 1
03	DSK 2

**Table 2 Valid Effect Address values for Key Src**

The **Effects Address** is ignored for Program & Preset commands

Valid crosspoint numbers are shown in Table 3.

Crosspoint	SE-1200 Mode
00	Black
01	Input 1
02	Input 2
03	Input 3
04	Input 4
05	Input 5
06	Input 6
07	--
08	--
09	Matte
10	Pattern (Bars)

**Table 3 Valid Crosspoint Numbers**

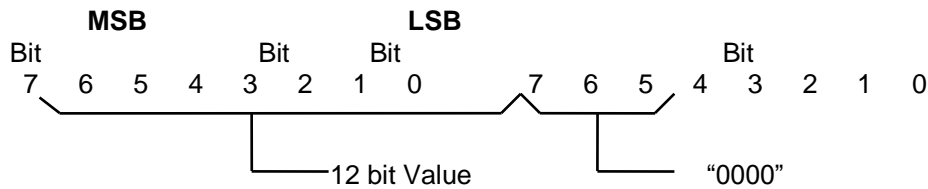
If a crosspoint number greater than 10 is specified, then Black will be selected.

## ANALOGUE CONTROLS (45/C5)

Function	Byte Count	Effects Address	Command Code (Hex)	Message
Read Control	03	EX	45	Control
Write Control	05	EX	C5	Control, LSB, MSB

The **Read Command** returns the current value of the designated control. The value is returned in the form of the corresponding write command.

The **Write Command** is followed by two further bytes, the LSB, followed by the MSB. The Analogue values are either twelve bit values and are detailed in Figure 3.



**Figure 3 - Twelve Bit Analogue Value**

Effectively these values are 16-bit unsigned/signed values with the lower 4 LSBs always set to zero.

### Analog Value Scaling

The Analog values in the Serial Protocol are scaled to map onto the SE-1200 internal values

The following table defines the scaling used for each of the Analog controls available in the protocol.

Analog Type	Analog Range (Hex)	Control Range	Float Scaling
ANALOG100	0x000 – 0xFFF	0.0 – 100.0	(65520.0f / 100.0f)
ANALOG100S	0x800 – 0x7FF	-100.0 – + 100.0	(32752.0f / 100.0f)
ANALOG360	0x000 – 0xFFF	0.0 – 360.0	(65520.0f / 360.0f)
ANALOG16	0x000 – 0xFFF	0.0 – 16.0	(65520.0f / 16.0f)
ANALOG16S	0x800 – 0x7FF	-16.0 – +16.0	(32752.0f / 16.0f)

To convert from Float to 'Analog Type', multiply by the appropriate Float Scaling and mask with 0xff0

The analogue control numbers are shown in Table 4.

Control (Hex)	EX	Control Name	Range (Hex)	Analog Type
08	00	DSK 1 Lift	0 - FFF	ANALOG100
09	00	DSK 1 Gain	0 - FFF	ANALOG16
0a	00	DSK 1 Matte Hue	0 - FFF	ANALOG360
0b	00	DSK 1 Matte Sat	0 - FFF	ANALOG100
0c	00	DSK 1 Matte Luma	0 - FFF	ANALOG100
08	03	DSK 2 Lift	0 - FFF	ANALOG100
09	03	DSK 2 Gain	0 - FFF	ANALOG16
0a	03	DSK 2 Matte Hue	0 - FFF	ANALOG360
0b	03	DSK 2 Matte Sat	0 - FFF	ANALOG100
0c	03	DSK 2 Matte Luma	0 - FFF	ANALOG100
00	01	Transition Arm	0 - FFF	ANALOG100
0a	01/ 02	Key 1 / 2 Linear Lift	0x800 – 0x7FF	ANALOG100S
0b	01/ 02	Key 1 / 2 Linear Gain	0 - FFF	ANALOG16
0c	01/ 02	Key 1 / 2 Chroma Key Fgnd	0x800 – 0x7FF	ANALOG100S
0d	01/ 02	Key 1 / 2 Chroma Key Bgnd	0x800 – 0x7FF	ANALOG100S
11	01	Positioner (vert)	0x800 – 0x7FF	ANALOG16S
12	01	Positioner (horz)	0x800 – 0x7FF	ANALOG16S
14	01	Bus Matte Hue	0 - FFF	ANALOG360
17	01/ 02	Key 1 / 2 Chroma Key Hue	0 - FFF	ANALOG360
18	01	Wipe Border Hue	0 - FFF	ANALOG360
19	01	Wipe Border Sat	0 - FFF	ANALOG100
1A	01	Wipe Border Luma	0 - FFF	ANALOG100
1B	01	Bus Matte Luma	0 - FFF	ANALOG100
1C	01	Wipe Aspect	0 - FFF	Not Supported
1D	01	Wipe Border Softness	0 - FFF	ANALOG100
1E	01	Wipe Border Width	0 - FFF	ANALOG100
1F	01	Bus Matte Sat	0 - FFF	ANALOG100

**Table 4 Analogue Control Numbers**

#### **PUSHBUTTON/LAMP CONTROLS (46, 47 / C6, C7)**

Function	Byte Count	Effects Address	Command Code (Hex)	Message
Read PB/L	03	EX	46/47	PB/Lamp
Write PB/L ON	03	EX	C6	PB/Lamp
Write PB/L OFF	03	EX	C7	PB/Lamp

The **Read Command** is used to determine the status of any push-button or lamp by returning the appropriate form of the write command.

The **Write Command** allows the desired lamp to be turned on or off.

This command is similar to the pushbutton/lamp select command (FB), but there are a few differences to note.

In the SE1200 Keyboard Control Protocol there are three types of selection buttons:

- those that toggle between two states (e.g. REVERSE),
  - those that are single shot (e.g. AUTO-TRANS),
  - and those that select a member of a group (e.g. Program Bus).
- When writing to a toggle type lamp, this command (C6/C7) must select the correct state to have any effect, while the select (FB) command toggles the lamp to the next state.
  - When writing to a single-shot type, the off (C7) command is non-functional.
  - Writing an On (C6) to a group lamp is equivalent to writing a select (FB) command, while the Off (C7) command will have no effect.

Additionally, this command can force an immediate cut of the DSK or fade to black by writing an on or off to the DSK ON lamp (0D) or fade to black lamp (1F).

Note:

- The read values for the DSK FADE and FADE to BLACK lamps are as follows: the DSK FADE lamp is ON while fading or paused, and OFF otherwise, whereas the Fade-to-Black lamp is ON when faded, and off while fading or otherwise. This is to maintain continuity with the GVG100™ protocol.

The numbers for the lamps are shown in Table 5.

PB/L No	Read Function	Write Function
0x00	Program Bus Crosspoint Black	Program Bus Crosspoint BLACK
0x01	Program Bus Crosspoint 1	Program Bus Crosspoint 1
0x02	Program Bus Crosspoint 2	Program Bus Crosspoint 2
03	Program Bus Crosspoint 3	Program Bus Crosspoint 3
04	Program Bus Crosspoint 4	Program Bus Crosspoint 4
05	Program Bus Crosspoint Still / 5	Program Bus Crosspoint Still / 5
06	Program Bus Crosspoint Freeze / 6	Program Bus Crosspoint Freeze / 6
07	Program Bus Crosspoint Matte	Program Bus Crosspoint Matte
08	Program Bus Crosspoint Pattern (Bars)	Program Bus Crosspoint Pattern (Bars)
09		
0A		
0B	Auto Transition	Auto Transition
0C	DSK Trans	DSK Trans
0D	DSK On	DSK On
0E	Wipe Transition	Wipe Transition
0F	Mix Transition	Mix Transition
10	Preset Bus Crosspoint Black	Preset Bus Crosspoint Black
11	Preset Bus Crosspoint 1	Preset Bus Crosspoint 1
12	Preset Bus Crosspoint 2	Preset Bus Crosspoint 2
13	Preset Bus Crosspoint 3	Preset Bus Crosspoint 3
14	Preset Bus Crosspoint 4	Preset Bus Crosspoint 4



PB/L No	Read Function	Write Function
15	Preset Bus Crosspoint Still / 5	Preset Bus Crosspoint Still / 5
16	Preset Bus Crosspoint Freeze / 6	Preset Bus Crosspoint Freeze / 6
17	Preset Bus Crosspoint Matte	Preset Bus Crosspoint Matte
18	Preset Bus Crosspoint Pattern (Bars)	Preset Bus Crosspoint Pattern (Bars)
19		
1A		
1b	DSK 2 On	DSK 2 On
1C		Freeze Cap
1D	REVERSE Wipe	REVERSE Wipe
1E	DVK PWV	DSK PWV
1F	Fade to Black	Fade to Black
20	KEY1 Bus Crosspoint Black	KEY1 Bus Crosspoint Black
21	KEY1 Bus Crosspoint 1	KEY1 Bus Crosspoint 1
22	KEY1 Bus Crosspoint 2	KEY1 Bus Crosspoint 2
23	KEY1 Bus Crosspoint 3	KEY1 Bus Crosspoint 3
24	KEY1 Bus Crosspoint 4	KEY1 Bus Crosspoint 4
25	KEY1 Bus Crosspoint Still / 5	KEY1 Bus Crosspoint Still / 5
26	KEY1 Bus Crosspoint Freeze / 6	KEY1 Bus Crosspoint Freeze / 6
27	KEY1 Bus Crosspoint Matte	KEY1 Bus Crosspoint Matte
28	KEY1 Bus Crosspoint Pattern (Bars)	KEY1 Bus Crosspoint Pattern (Bars)
29		
2a		
2b		
2c	Clip Transition	Clip Transition
2d	Wipe Border On/Off	Wipe Border On/Off
2e	DSK 1 Matte Fill	DSK 1 Matte Fill
2f	DSK 1 Spit Mode	DSK 1 Spit Mode
30	Horizontal Wipe	Horizontal Wipe
31	Vertical Wipe	Vertical Wipe
32	Horizontal Split Wipe	Horizontal Split Wipe
33	Vertical Split Wipe	Vertical Split Wipe
34	Left Bottom Corner Wipe	Left Bottom Corner Wipe
35	Right Bottom Corner Wipe	Right Bottom Corner Wipe
36	Left Diagonal Wipe	Left Diagonal Wipe
37	Box Wipe	Box Wipe
38	Diamond Wipe	Diamond Wipe
39	Circle Wipe	Circle Wipe
3a	Heart Wipe	Heart Wipe
3b	Cross Wipe	Cross Wipe
3c	XCross Wipe	XCross Wipe
3d	Left Top Corner Wipe	Left Top Corner Wipe
3e	Right Top Corner Wipe	Right Top Corner Wipe
3f	Right Diagonal Wipe	Right Diagonal Wipe
46	DSK1 Trans Enable	DSK1 Trans Enable
47	DSK2 Trans Enable	DSK2 Trans Enable
48	Transition Bgnd Select	Transition Bgnd Select
49	Transition Key1	Transition Key1
4a	N/A	CUT

PB/L No	Read Function	Write Function
4b	Transition Key2	Transition Key2
4c	Transition PVW	Transition PVW
4d		
4e		Current Keyer – CK Auto
4f	Grab Save	Grab Save
50		
51		
52	Key 1 On	Key 1 On
53	Key 2 On	Key 2 On
54		
55		
56		
57	Trans speed 1 Select	Trans speed 1 Select
58	Trans speed 2 Select	Trans speed 2 Select
59	Trans speed 3 Select	Trans speed 3 Select
5a	Current Keyer – P-in-P Enable	Current Keyer – P-in-P Enable
5b	Current Keyer – P-in-P Lite Enable	Current Keyer – P-in-P Lite Enable
5c	<i>PGM Src Still Mode (Live, Frz, Still)</i>	<i>PGM Src Still Mode (Live, Frz, Still)</i>
5d	<i>PST Src Still Mode (Live, Frz, Still)</i>	<i>PST Src Still Mode (Live, Frz, Still)</i>
5e		
5f		
60	Menu	Menu
61	Menu Up	Menu Up
62	Menu Down	Menu Down
63	Menu Left	Menu Left
64	Menu Right	Menu Right
65	Menu Enter	Menu Enter
66	Menu Normal	Menu Normal
67		
68	Key 1 Select	Key 1 Select
69	Key 2 Select	Key 2 Select
6a	DSK 1 Select	DSK 1 Select
6b	DSK 2 Select	DSK 2 Select
6c	Current Keyer – Luma Mode	Current Keyer – Luma Mode
6d	Current Keyer – Lin Mode	Current Keyer – Lin Mode
6e	Current Keyer – Chroma Mode	Current Keyer – Chroma Mode

**Table 5 Pushbutton/Lamp Numbers.**

#### WIPE PATTERN (48/C8)

Function	Byte Count	Effects Address	Command Code (Hex)	Message
Read Wipe Pattern	02	EX	48	-
Write Wipe Pattern	03	EX	C8	Wipe Num

The **Read Command** returns the currently selected wipe pattern in the form of the corresponding write

command.

The **Write Command** will select the pattern as listed below.

**Patterns 1 - 32** select SE-1200 Wipe Patterns 1-32, and select Wipe as the Transition Type

The selected wipe can then be run using the Lever Arm control or the AUTO-TRANS Button.

#### TRANSITION MODE (4A/CA)<sup>2</sup>

Function	Byte Count	Effects Address	Command Code (Hex)	Message
Read Transition mode	02	EX	4A	-
Write Transition mode	03	EX	CA	Mode

The **Read Command** returns the currently selected Transition Mode

The **Write Command** selects the Transition Mode as shown in Figure 4 Transition Mode

Bits [2:0]	Description
000	None
001	BKGD Unselected, Key 1 Unselected, Key 2 Selected
010	BKGD Unselected, Key 1 Selected, Key 2 Unselected
011	BKGD Unselected, Key 1 Selected, Key 2 Selected
100	BKGD Selected, Key 1 Unselected, Key 2 Unselected
101	BKGD Selected, Key 1 Unselected, Key 2 Selected
110	BKGD Selected, Key 1 Selected, Key 2 Unselected
111	BKGD Selected, Key 1 Selected, Key 2 Selected,

**Figure 4 Transition Mode**

#### TRANSITION RATE (4C,4D,7D/CC,CD,FD)

Function	Byte Count	Effects Address	Command Code (Hex)	Message
Read M/E Trans Rate	02	EX	4C	-
Write M/E Trans Rate	05	EX	CC	Rate 1,2,3
Read DSK Trans Rate	02	EX	4D	-
Write DSK Trans Rate	05	EX	CD	Rate 1,2,3
Read Fade-to-Black Rate	02	EX	7D	-
Write Fade-to-Black Rate	05	EX	FD	Rate 1,2,3

This command reads and writes the rate at which Se1200 will perform the indicated transition, and sets the Transition Mode.

Three BCD format bytes are used to set the rate:

Rate 1 - Most significant digit of rate (Range 0-9)

Rate 2 - Middle digit of rate (Range 0-9)

Rate 3 - Least significant digit of rate (Range 0-9)

Rate 1 can also be used to set the Transition Enable bits, and Trigger the transition

## M/E Transition Rate Byte Format (0xCC)

See Figure 5 - *Transition Rate Byte Format (M/E Transition)*

Rate Bytes	Description
Rate 1	<p>Most significant digit of rate (Range 0-9)</p> <p>Bits [3:0]: Rate value in BCD (0 - 9)</p> <p>Bits [6:4]:</p> <ul style="list-style-type: none"> <li>000 - M/E Trans: No change</li> <li>001 - M/E Trans: Key 2 Only</li> <li>010 - M/E Trans: Key 1 Only</li> <li>011 - M/E Trans: Key 1 &amp; Key 2</li> <li>100 - M/E Trans: BKGD Only</li> <li>101 - M/E Trans: BKGD &amp; Key 2</li> <li>110 - M/E Trans: BKGD &amp; Key 1</li> <li>111 - M/E Trans: BKGD, Key 1 &amp; Key 2</li> </ul> <p>Bit 7:</p> <ul style="list-style-type: none"> <li>0 - Update Only</li> <li>1 - Update &amp; then do transition</li> </ul>
Rate 2	<p>Middle digit of rate (Range 0-9)</p> <p>Bits [3:0]: Rate value in BCD (0 - 9)</p> <p>Bits [7:4]: Don't Care</p>
Rate 3	<p>Least significant digit of rate (Range 0-9)</p> <p>Bits [3:0]: Rate value in BCD (0 - 9)</p> <p>Bits [7:4]: Don't Care</p>

**Figure 5 - *Transition Rate Byte Format (M/E Transition)***

## DSK Transition Rate Byte Format (0xCD)

See Figure 5 - *Transition Rate Byte Format* (DSK Transition)

Rate Bytes	Description
Rate 1	<p>Most significant digit of rate (Range 0-9)</p> <p>Bits [3:0]: Rate value in BCD (0 - 9)</p> <p>Bits [5:4]:</p> <ul style="list-style-type: none"> <li>00 - DSK Trans: None</li> <li>01 - DSK Trans: DSK 2 Only</li> <li>10 - DSK Trans: DSK 1 Only</li> <li>11 - DSK Trans: DSK 1 &amp; DSK 2</li> </ul> <p>Bit 6: Not used</p> <p>Bit 7:</p> <ul style="list-style-type: none"> <li>0 - Update Only</li> <li>1 - Update &amp; then do transition</li> </ul>
Rate 2	<p>Middle digit of rate (Range 0-9)</p> <p>Bits [3:0]: Rate value in BCD (0 - 9)</p> <p>Bits [7:4]: Not used</p>
Rate 3	<p>Least significant digit of rate (Range 0-9)</p> <p>Bits [3:0]: Rate value in BCD (0 - 9)</p> <p>Bits [7:4]: Not used</p>

**Figure 8 - *Transition Rate Byte Format (DSK Transition)***

## Save User Mem (--/DA)

Function	Byte Count	Effects Address	Command Code (Hex)	Message
Save User Mem	03	EX	DA	User Mem (0-255)

Saves the current switcher state to the User Memory selected (0-255)

## Load User Mem (--/DB)

Function	Byte Count	Effects Address	Command Code (Hex)	Message
Load User Mem	03	EX	DB	User Mem (0-255)

Loads the selected User Memory (0-255)

### Menu Select(--/DE)

Function	Byte Count	Effects Address	Command Code	Message
Menu Select	03	EX	DE (Hex)	Menu Num (0-7)

Causes a menu item to be displayed on the Multiview Output

Currently defined Menus are:

Menu Num	Menu
0	Main Menu
1	Border Soft
2	Border Width
3	Border Colour
4	Keyer Setup
5	PiP Setup
6	DSK Setup
7	Stills Menu

### Crosspoint Remap (60 / E0)

Function	Byte Count	Effects Address	Command Code (Hex)	Message
Read Crosspoint	03	EX	60	Crosspoint
Write Crosspoint	04	EX	E0	Crosspoint, Source

Allows control over the SE-1200 Crosspoint remapping function

The **Write Command** sets switcher 'Crosspoint' to come from Input 'Source'.

The **Read Command** returns the source currently associated with 'Crosspoint' in the form of the corresponding **Write Command**.

The **Effects Address** is ignored, and can be set to any value.

Valid Crosspoint numbers are shown in **Table 6**.

Crosspoint #	Assigned to:
01	Input 1
02	Input 2
03	Input 3
04	Input 4
05	Input 5
06	Input 6

**Table 6** *Valid Crosspoint Numbers*

## STATUS UPDATE (6E/EE)

Function	Byte Count	Effects Address	Command Code (Hex)	Message
Request Status Packet	03	EX	6E	Bit 0: 0 – No Sync 1 – Field Sync  Bit 1: 0 – Always 1 – Only when changed
Status Update Data	09	EX	EE	Status Packet

The Keyboard can request a status update packet by sending the 0x6e command to the Main board

Message values:

Bit 0:

- 0 - the MU will respond with the status packet immediately
- 1 - then the MU will wait until the next field event, and then send the status packet
- This allows the Controller to field-synchronise to the MU.

Bit 1:

- 0 – Always
- 1 – Only when changed

## SE-1200 Status Packet

The format of the Status Packet in the SE-1200 is:

	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
<b>Byte 0</b>	PVW3	PVW2	PVW1	PVW0	PGM3	PGM2	PGM1	PGM0
<b>Byte 1</b>	Keyer Fill3	Keyer Fill2	Keyer Fill1	Keyer Fill0	Keyer Key3	Keyer Key2	Keyer Key1	Keyer Key0
<b>Byte 2</b>	PST Src Still	Keyer PiP Lite	Keyer Chroma	Keyer Linear	Keyer Luma	Keyer PiP	Keyer Top	Keyer On
<b>Byte 3</b>	REV	Clip (Trans1)	WIPES5	WIPES4	WIPES3	WIPES2	WIPES1	WIPES0
<b>Byte 4</b>	PGM Src Still	DSK2 PGM	DSK1 PGM	Key2 PGM	Key1 PGM	Keysel1	Keysel0	FRZ/CAP
<b>Byte 5</b>	BDR On/Off	Grab Save	DSK Auto	DSK2 PVW	DSK1 PVW	Key2 PVW	Key1 PVW	Trans BG
<b>Byte 6</b>	Firmware Update	Menu	Auto	PVW TRANS	Mix/ Wipe (Trans 0)	Speed1	Speed0	FTB



### Get & Set Control Commands (70/F0)

Function	Byte Count	Effects Address	Command Code (Hex)	Message
Get Control(s)	02 + (4 * n)	00	70	n * (4-byte Control ID)
Set Control(s)	02 + (8 * n)	00	F0	n * (4-byte Control ID + 4-byte Control Value)

These commands allow access to the full range of SE-1200 Controls

- This is achieved by wrapping the Get & Set Control Commands of the Ethernet Control Protocol inside the serial protocol format.
- This format is quite long – 8 bytes are needed to specify the parameter and value
  - o Control ID (4 bytes)
  - o Value (4 bytes)
    - The value field is always 4 bytes
    - Allows 32-bit floats
- Multiple Controls can be written/read with one command
  - o This improves the transmission efficiency since there is only one Command overhead, and only one acknowledge needed.
- For Get Control, the sender sends the list of Controls to be returned
  - o The switcher then returns just the Set Command(0xnn, 0x00, 0xf0) + Value data (not the Control IDs)
  - o This also saves re-transmitting the Control IDs, which are already known

See **Section 4** of the **Ethernet Control protocol** for list of **Control IDs** available.

### ALL STOP (--/F2)

Function	Byte Count	Effects Address	Command Code (Hex)	Message
Write All Stop	03	EX	F2	d0

This is a write only command and performs the following operations:

- Clear all active transitions.
- Clear all frozen transitions.
- Return transition control to lever arm.
- Set transition type to MIX.
- If faded to black, then bring switcher out of black.

The d0 byte is not used.

### PUSHBUTTON/LAMP SELECT (--/FB)

Function	Byte Count	Effects Address	Command Code (Hex)	Message
Write Pushbutton	03	EX	FB	Pb #

This write only command performs a 'push' of the desired button as if it had been pushed on the front panel. Refer to Table 5 for lamp numbers

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