

HT500 E-LINK DLP™ VIDEO PROJECTOR



RS-232C CONTROL SPECIFICATIONS

Document Revision 1.0 (15 October 2004)





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Revision History:

Revision	Date	Software Version	Description of Change
1.0	15 October 2004	2.39.05 L or higher	Initial version.

1. Introduction

This document describes the communication and data formats used to control SIM2 HT500 E-LINK projector via RS-232C port.

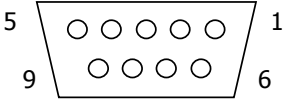
2. Connection

Switch off your Personal Computer and Projector before connecting RS 232C cable.

Use a standard serial cable with 9 pin female to the Personal Computer and 9 pin male to the Projector: pin 2 connects to pin2, pin 3 to pin 3 and pin 5 to pin 5.

SIM2 HT500 E-LINK RS-232C Port is described as follows.

SIM 2 HT500 E-LINK RS-232C Control Port:

D-SUB 9-pin (female)	Pin No	Signal	Definition
		1	N/A
2		TD	Transmit data
3		RD	Receive data
4		N/A	Not used
5		GND	Ground
6		N/A	Not used
7		N/A	Not used
8		N/A	Not used
9		N/A	Not used

Switch on the Personal Computer and, after start up, switch on the Projector.

Load a suitable communication software onto your Personal Computer, and set the Serial Port Parameters as shown below.

Communication Parameters:

Parameter	Value
Transfer Rate	19200 bps
Data Bits	8
Parity Bit	None
Stop Bit	1
Flow Control	None

Set Send Mode and Read Mode to HEX.

3. Communication Protocol

The communication protocol is packet oriented. Packets consists of Header and Payload.

There are two types of packets: Event and Operation.

The packet header size is fixed (7 bytes), while the packet payload type and content varies based on the type of packet: Event payload size is 6 bytes, while Operation payload size is 25 bytes.

The entire packet size is variable, being the sum of the fixed-size packet header and variable-sized packet payload: Event packet size is 13 bytes and Operation packet size is 32 bytes.

Each packet received by the projector is acknowledged with a return code:

- 06: Acknowledged with no error
- 15: Acknowledged, but an error has occurred.

Header

All Packets use the same Packet Header format.

The Packet Header size is fixed at seven bytes.

0	1	2	3	4	5	6
BE	EF	Packet Type	Packet Payload Size		Packet Checksum (CRC)	

0xEFBE is a fixed value that is used to insure packet alignment if there are partial packets received or byte lost. The ls-byte of the word 0xBE is sent first, then the ms-byte 0xEF.

The **Packet Type** is a number (a byte in length) that defines the type of data in the packet.

The **Packet Payload Size** is a number (two bytes) that defines the size of the payload portion of the packet.

For a given Packet Type, Packet Size is fixed.

The **Packet Checksum** (two bytes) is the CRC value for the entire packet (Header and Payload).

Payload

The packet payload format depends on the packet type.

The Event packet payload size is 6 bytes, while the Operation packet payload size is 25 bytes.

Event Packet Format:

0	1	2	3	4	5
Event		00	00	00	00

Operation Packet Format:

0	1	2	3	4	5	6	7	8	9	10	11	12
Op Type	Op ID		00	00	Op Target		00	00	Op Value		00	00
13	14	15	16	17	18	19	20	21	22	23	24	
00	00	00	00	00	00	00	00	00	00	00	00	

4. Commands

Remote Control Keycodes

The following commands send simulated Remote Control input to SIM2 HT500 E-LINK projector.

Remote Control Keycodes:

Key	Command
STAND BY	BE EF 02 06 00 51 E4 48 01 00 00 00 00
0 ⁽¹⁾	BE EF 02 06 00 6B E6 52 01 00 00 00 00
1 ⁽²⁾	BE EF 02 06 00 80 E5 49 01 00 00 00 00
2 ⁽²⁾	BE EF 02 06 00 B3 E5 4A 01 00 00 00 00
3 ⁽²⁾	BE EF 02 06 00 62 E4 4B 01 00 00 00 00
4 ⁽²⁾	BE EF 02 06 00 D5 E5 4C 01 00 00 00 00
5 ⁽²⁾	BE EF 02 06 00 04 E4 4D 01 00 00 00 00
6 ⁽²⁾	BE EF 02 06 00 37 E4 4E 01 00 00 00 00
7 ⁽²⁾	BE EF 02 06 00 E6 E5 4F 01 00 00 00 00
8 ⁽²⁾	BE EF 02 06 00 89 E7 50 01 00 00 00 00
9 ⁽²⁾	BE EF 02 06 00 58 E6 51 01 00 00 00 00
10 ⁽²⁾	BE EF 02 06 00 BC E0 75 01 00 00 00 00
11 ⁽²⁾	BE EF 02 06 00 8F E0 76 01 00 00 00 00
12 ⁽²⁾	BE EF 02 06 00 5E E1 77 01 00 00 00 00
ESC	BE EF 02 06 00 0D E6 54 01 00 00 00 00
CURSOR UP	BE EF 02 06 00 DC E7 55 01 00 00 00 00
CURSOR LEFT	BE EF 02 06 00 EF E7 56 01 00 00 00 00
CURSOR RIGHT	BE EF 02 06 00 3E E6 57 01 00 00 00 00
CURSOR DOWN	BE EF 02 06 00 C1 E6 58 01 00 00 00 00
MENU LEFT (-)	BE EF 02 06 00 10 E7 59 01 00 00 00 00
MENU RIGHT (+)	BE EF 02 06 00 23 E7 5A 01 00 00 00 00
FREEZE	BE EF 02 06 00 F2 E6 5B 01 00 00 00 00
MEMORY	BE EF 02 06 00 45 E7 5C 01 00 00 00 00
F1 (ZOOM)	BE EF 02 06 00 94 E6 5D 01 00 00 00 00
F2 (FOCUS)	BE EF 02 06 00 76 E7 5F 01 00 00 00 00
INFO	BE EF 02 06 00 A7 E6 5E 01 00 00 00 00
AUTO	BE EF 02 06 00 79 E2 60 01 00 00 00 00
ASPECT NORMAL	BE EF 02 06 00 2A F4 83 01 00 00 00 00
ASPECT ANAMORPHIC	BE EF 02 06 00 9D F5 84 01 00 00 00 00
ASPECT LETTERBOX	BE EF 02 06 00 4C F4 85 01 00 00 00 00
ASPECT PANORAMIC	BE EF 02 06 00 7F F4 86 01 00 00 00 00
ASPECT PIXEL TO PIXEL	BE EF 02 06 00 AE F5 87 01 00 00 00 00



ASPECT USER 1	BE EF 02 06 00 51 F5 88 01 00 00 00 00
ASPECT USER 2	BE EF 02 06 00 80 F4 89 01 00 00 00 00
ASPECT USER 3	BE EF 02 06 00 B3 F4 8A 01 00 00 00 00
VCR	BE EF 02 06 00 9B E3 62 01 00 00 00 00

Direct access codes

Goto Brightness	BE EF 02 06 00 C7 E1 7E 01 00 00 00 00
Goto Contrast	BE EF 02 06 00 16 E0 7F 01 00 00 00 00
Goto Color	BE EF 02 06 00 19 F4 80 01 00 00 00 00
Goto Tint	BE EF 02 06 00 C8 F5 81 01 00 00 00 00

- (1) When the unit is in Stand-by state, this command switches on the unit and the last source memorised prior to switch off is automatically selected.
- (2) When the unit is in Stand-by state, this command switches on the unit and selects the corresponding Source.



Operation Codes

The following codes provide direct access to SIM2 HT500 E-LINK User Interface operations not accessible via a single Remote Control command.

Operation Codes:

Operation	Action	Command
BRIGHTNESS	INCREMENT	BE EF 03 19 00 AB 7E 03 00 08 00
	DECREMENT	BE EF 03 19 00 C5 D4 04 00 08 00
CONTRAST	INCREMENT	BE EF 03 19 00 3E 23 03 01 08 00
	DECREMENT	BE EF 03 19 00 50 89 04 01 08 00
COLOR	INCREMENT	BE EF 03 19 00 C1 C7 03 02 08 00
	DECREMENT	BE EF 03 19 00 AF 6D 04 02 08 00
TINT	INCREMENT	BE EF 03 19 00 54 9A 03 03 08 00
	DECREMENT	BE EF 03 19 00 3A 30 04 03 08 00
SHARPNESS (Video)	INCREMENT	BE EF 03 19 00 7E 0C 03 04 08 00
	DECREMENT	BE EF 03 19 00 10 A6 04 04 08 00
SHARPNESS FILTER	INCREMENT	BE EF 03 19 00 D4 C4 03 09 08 00
	DECREMENT	BE EF 03 19 00 BA 6E 04 09 08 00
SHARPNESS MODE	SET VIDEO	BE EF 03 19 00 7A 80 01 60 02 00
	SET GRAPHICS	BE EF 03 19 00 EA 41 01 60 02 00 00 00 00 00 00 00 00 01 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
CINEMA MODE	SET OFF	BE EF 03 19 00 33 43 01 07 08 00
	SET AUTO	BE EF 03 19 00 A3 82 01 07 08 00 00 00 00 00 00 00 00 01 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
VIDEO TYPE	SET NORMAL	BE EF 03 19 00 A6 1E 01 06 08 00
	SET VCR	BE EF 03 19 00 36 DF 01 06 08 00 00 00 00 00 00 00 00 01 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
POSITION HORIZONTAL	INCREMENT	BE EF 03 19 00 55 BA 03 21 08 00
	DECREMENT	BE EF 03 19 00 3B 10 04 21 08 00
POSITION VERTICAL	INCREMENT	BE EF 03 19 00 AA 5E 03 22 08 00
	DECREMENT	BE EF 03 19 00 C4 F4 04 22 08 00
COLOR TEMPERATURE	01	BE EF 03 19 00 D6 F4 01 C2 09 00
	02	BE EF 03 19 00 46 35 01 C2 09 00 00 00 00 00 00 00 00 01 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	03	BE EF 03 19 00 B7 75 01 C2 09 00 00 00 00 00 00 00 00 02 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00



COLOR TEMPERATURE	04	BE EF 03 19 00 27 B4 01 C2 09 00 00 00 00 00 00 00
	05	BE EF 03 19 00 15 F6 01 C2 09 00 00 00 00 00 00 00
	06	BE EF 03 19 00 85 37 01 C2 09 00 00 00 00 00 00 00
	07	BE EF 03 19 00 74 77 01 C2 09 00 00 00 00 00 00 00
	08	BE EF 03 19 00 E4 B6 01 C2 09 00 00 00 00 00 00 00
	09	BE EF 03 19 00 10 F3 01 C2 09 00 00 00 00 00 00 00
	10	BE EF 03 19 00 80 32 01 C2 09 00 00 00 00 00 00 00
	11	BE EF 03 19 00 71 72 01 C2 09 00 00 00 00 00 00 00
	12	BE EF 03 19 00 E1 B3 01 C2 09 00 00 00 00 00 00 00
	13	BE EF 03 19 00 D3 F1 01 C2 09 00 00 00 00 00 00 00
	14	BE EF 03 19 00 43 30 01 C2 09 00 00 00 00 00 00 00
	15	BE EF 03 19 00 B2 70 01 C2 09 00 00 00 00 00 00 00
	16	BE EF 03 19 00 22 B1 01 C2 09 00 00 00 00 00 00 00
	17	BE EF 03 19 00 1A F9 01 C2 09 00 00 00 00 00 00 00
	18	BE EF 03 19 00 8A 38 01 C2 09 00 00 00 00 00 00 00
	19	BE EF 03 19 00 7B 78 01 C2 09 00 00 00 00 00 00 00
	20	BE EF 03 19 00 EB B9 01 C2 09 00 00 00 00 00 00 00
	21	BE EF 03 19 00 D9 FB 01 C2 09 00 00 00 00 00 00 00
	22	BE EF 03 19 00 49 3A 01 C2 09 00 00 00 00 00 00 00
	23	BE EF 03 19 00 B8 7A 01 C2 09 00 00 00 00 00 00 00
	24	BE EF 03 19 00 28 BB 01 C2 09 00 00 00 00 00 00 00
	25	BE EF 03 19 00 DC FE 01 C2 09 00 00 00 00 00 00 00
	26	BE EF 03 19 00 4C 3F 01 C2 09 00 00 00 00 00 00 00
	27	BE EF 03 19 00 BD 7F 01 C2 09 00 00 00 00 00 00 00
	28	BE EF 03 19 00 2D BE 01 C2 09 00 00 00 00 00 00 00
	29	BE EF 03 19 00 1F FC 01 C2 09 00 00 00 00 00 00 00
	30	BE EF 03 19 00 8F 3D 01 C2 09 00 00 00 00 00 00 00
	31	BE EF 03 19 00 7E 7D 01 C2 09 00 00 00 00 00 00 00
	32	BE EF 03 19 00 EE BC 01 C2 09 00 00 00 00 00 00 00



COLOR TEMPERATURE	33	BE EF 03 19 00 0E ED 01 C2 09 00 00 00 00 00 00 00
	34	BE EF 03 19 00 9E 2C 01 C2 09 00 00 00 00 00 00 00
	35	BE EF 03 19 00 6F 6C 01 C2 09 00 00 00 00 00 00 00
	36	BE EF 03 19 00 FF AD 01 C2 09 00 00 00 00 00 00 00 00
GAMMA	01	BE EF 03 19 00 FA 59 01 27 08 00 00 00 00 00 00 00 00
	02	BE EF 03 19 00 6A 98 01 27 08 00 00 00 00 00 00 00 00
	03	BE EF 03 19 00 0E 1C 01 27 08 00 00 00 00 00 00 00 00
	04	BE EF 03 19 00 FF 5C 01 27 08 00 00 00 00 00 00 00 00
	05	BE EF 03 19 00 6F 9D 01 27 08 00 00 00 00 00 00 00 00
	06	BE EF 03 19 00 5D DF 01 27 08 00 00 00 00 00 00 00 00 00
	07	BE EF 03 19 00 CD 1E 01 27 08 00 00 00 00 00 00 00 00 00
	08	BE EF 03 19 00 3C 5E 01 27 08 00 00 00 00 00 00 00 00 00
	USER	BE EF 03 19 00 0B 19 01 27 08 00 00 00 00 00 00 00 00 00
	FREQUENCY	INCREMENT
	DECREMENT	BE EF 03 19 00 7B 3F 04 24 08 00 00 00 00 00 00 00 00 00
PHASE	INCREMENT	BE EF 03 19 00 80 C8 03 25 08 00 00 00 00 00 00 00 00 00
	DECREMENT	BE EF 03 19 00 EE 62 04 25 08 00 00 00 00 00 00 00 00 00 00
Y/C DELAY	INCREMENT	BE EF 03 19 00 7F 2C 03 26 08 00 00 00 00 00 00 00 00 00
	DECREMENT	BE EF 03 19 00 11 86 04 26 08 00 00 00 00 00 00 00 00 00
MAGNIFICATION	INCREMENT	BE EF 03 19 00 FF 72 03 2C 08 00 00 00 00 00 00 00 00 00
	DECREMENT	BE EF 03 19 00 91 D8 04 2C 08 00 00 00 00 00 00 00 00 00 00
PAN HORIZONTAL	INCREMENT	BE EF 03 19 00 6A 2F 03 2D 08 00 00 00 00 00 00 00 00 00
	DECREMENT	BE EF 03 19 00 04 85 04 2D 08 00 00 00 00 00 00 00 00 00 00
PAN VERTICAL	INCREMENT	BE EF 03 19 00 95 CB 03 2E 08 00 00 00 00 00 00 00 00 00 00
	DECREMENT	BE EF 03 19 00 FB 61 04 2E 08 00 00 00 00 00 00 00 00 00 00
KEystone VERTICAL	INCREMENT	BE EF 03 19 00 01 26 03 1C 08 00 00 00 00 00 00 00 00 00
	DECREMENT	BE EF 03 19 00 6F 8C 04 1C 08 00 00 00 00 00 00 00 00 00 00
KEystone HORIZONTAL	INCREMENT	BE EF 03 19 00 6B 9F 03 1E 08 00 00 00 00 00 00 00 00 00 00
	DECREMENT	BE EF 03 19 00 05 35 04 1E 08 00 00 00 00 00 00 00 00 00 00



LANGUAGE	SET ENGLISH	BE EF 03 19 00 15 35 01 05 24 00 00 00 00 00 00 00
	SET ITALIANO	BE EF 03 19 00 85 F4 01 05 24 00 00 00 00 00 00 00
	SET FRANCAIS	BE EF 03 19 00 74 B4 01 05 24 00 00 00 00 00 00 00
	SET DEUTSCH	BE EF 03 19 00 E4 75 01 05 24 00 00 00 00 00 00 00
	SET ESPANOL	BE EF 03 19 00 D6 37 01 05 24 00 00 00 00 00 00 00
	SET PORTUGUES	BE EF 03 19 00 46 F6 01 05 24 00 00 00 00 00 00 00
OSD POSITION HORIZONTAL	INCREMENT	BE EF 03 19 00 82 88 03 61 08 00 00 00 00 00 00 00
	DECREMENT	BE EF 03 19 00 EC 22 04 61 08 00 00 00 00 00 00 00
OSD POSITION VERTICAL	INCREMENT	BE EF 03 19 00 7D 6C 03 62 08 00 00 00 00 00 00 00
	DECREMENT	BE EF 03 19 00 13 C6 04 62 08 00 00 00 00 00 00 00

INPUT 5 (COMP RGB 1) / SIGNAL TYPE	SET YCrCb AutoSync	BE EF 03 19 00 92 04 01 82 08 00 00 00 00 00 00 00
	SET YCrCb 15kHz	BE EF 03 19 00 5B 0C 01 82 08 00 00 00 00 00 00 00
	SET YCrCb 32kHz	BE EF 03 19 00 51 06 01 82 08 00 00 00 00 00 00 00
	SET RGB AutoSync	BE EF 03 19 00 97 01 01 82 08 00 00 00 00 00 00 00
	SET RGB 15kHz	BE EF 03 19 00 5E 09 01 82 08 00 00 00 00 00 00 00
	SET RGB 32kHz	BE EF 03 19 00 98 0E 01 82 08 00 00 00 00 00 00 00
INPUT 6 (COMP RGB 2) / SIGNAL TYPE	SET YCrCb AutoSync	BE EF 03 19 00 97 98 01 83 08 00 00 00 00 00 00 00
	SET YCrCb 15kHz	BE EF 03 19 00 5E 90 01 83 08 00 00 00 00 00 00 00
	SET YCrCb 32kHz	BE EF 03 19 00 54 9A 01 83 08 00 00 00 00 00 00 00
	SET RGB AutoSync	BE EF 03 19 00 92 9D 01 83 08 00 00 00 00 00 00 00
	SET RGB 15kHz	BE EF 03 19 00 5B 95 01 83 08 00 00 00 00 00 00 00
	SET RGB 32kHz	BE EF 03 19 00 9D 92 01 83 08 00 00 00 00 00 00 00
INPUT 7 (COMP RGB 3) / SIGNAL TYPE	SET YCrCb AutoSync	BE EF 03 19 00 4C 4E 01 84 08 00 00 00 00 00 00 00
	SET YCrCb 15kHz	BE EF 03 19 00 85 46 01 84 08 00 00 00 00 00 00 00
	SET YCrCb 32kHz	BE EF 03 19 00 8F 4C 01 84 08 00 00 00 00 00 00 00
	SET RGB AutoSync	BE EF 03 19 00 49 4B 01 84 08 00 00 00 00 00 00 00
	SET RGB 15kHz	BE EF 03 19 00 80 43 01 84 08 00 00 00 00 00 00 00
	SET RGB 32kHz	BE EF 03 19 00 46 44 01 84 08 00 00 00 00 00 00 00

INPUT 8 (COMP RGB 4) / SIGNAL TYPE	SET YCrCb AutoSync	BE EF 03 19 00 49 D2 01 85 08 00 00 00 00 00 00 00 17 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	SET YCrCb 15kHz	BE EF 03 19 00 80 DA 01 85 08 00 00 00 00 00 00 00 0B 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	SET YCrCb 32kHz	BE EF 03 19 00 8A D0 01 85 08 00 00 00 00 00 00 00 13 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	SET RGB AutoSync	BE EF 03 19 00 4C D7 01 85 08 00 00 00 00 00 00 00 1B 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	SET RGB 15kHz	BE EF 03 19 00 85 DF 01 85 08 00 00 00 00 00 00 00 07 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	SET RGB 32kHz	BE EF 03 19 00 43 D8 01 85 08 00 00 00 00 00 00 00 0F 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

MEMORY 1	RECALL	BE EF 03 19 00 85 EB 01 27 09 00 00 01 00 00 00 00 01 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	SAVE CURRENT SETTINGS	BE EF 03 19 00 54 D6 01 27 09 00 00 00 00 00 00 00 01 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	SAVE INITIAL SETTINGS	BE EF 03 19 00 45 9A 01 28 09 00 00 01 00 00 00 00 01 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
MEMORY 2	RECALL	BE EF 03 19 00 74 AB 01 27 09 00 00 01 00 00 00 00 02 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	SAVE CURRENT SETTINGS	BE EF 03 19 00 A5 96 01 27 09 00 00 00 00 00 00 00 02 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	SAVE INITIAL SETTINGS	BE EF 03 19 00 76 DE 01 28 09 00 00 02 00 00 00 00 01 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
MEMORY 3	RECALL	BE EF 03 19 00 E4 6A 01 27 09 00 00 01 00 00 00 00 03 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	SAVE CURRENT SETTINGS	BE EF 03 19 00 35 57 01 27 09 00 00 00 00 00 00 00 03 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
	SAVE INITIAL SETTINGS	BE EF 03 19 00 A7 E3 01 28 09 00 00 03 00 00 00 00 01 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

5. Examples

1. Send the simulated "SWITCH ON FROM STAND-BY AND SELECT SOURCE" Remote Control keycode.

Remote Control allows Switching on from Stand-by via one of the keys "1", "2" ... "11", "12".

Send, for instance, the code relative to key "1": BEEF02060080E5490100000000.

The projector switches on and selects Input 1.

The projector returns the response code: 06 (Acknowledged with no error).

NOTE: Commands that simulate keys "1", "2" ... "11", "12" switch on the unit and select the corresponding Source.

Command that simulate key 0 switches on the unit: the last source memorised prior to switch off is automatically selected.

2. Send the simulated "MENU RIGHT" Remote Control keycode.

Send the packet: BEEF02060023E75A0100000000.

The OnScreen Display appers on the screen.

The projector returns the response code: 06 (Acknowledged with no error).

3. Send the "SET ASPECT ANAMORPHIC" Operation Code.

Send the packet: BEEF0206009DF5840100000000.

