

MAX-HDMI816 & HDBT816 Series
RS-232 Command Code

Table of contents

RS232 Control code	Page
1. RS232 Protocol and Control Codes	
1-1 Communication Protocol (RS232)	2
1.2. 12: IP mode (IP)	2
1-3: RS232 Connection:	2
1-4: Message Timing Requirements	3
1-5: Message Structure	4
2. RS232 Control Code:	
2-1: System command	6
2-2: Product Link command.	9
2-3: Product control command.	13
2-4: Un-support control command.	23

MAX-HDMI816 & HDBT816 Series

RS-232 Command Code

1. RS232 Protocol and Control Codes

1-1 Communication Protocol (RS232):

Baud rate: 9600bps.

Data length: 8 bits.

Parity: No parity.

Stop bit: One bit.

X on/off: None.

1.2.12: IP mode (IP)

Support control By IP address ◦

1-3: RS232 Connection:



RS232 connector

Pin		Function
1	—	Not used
2	TX	Transmit data
3	RX	Receive data
4	—	Not used
5	Gnd	Signal ground
6	—	Not used
7	—	Not used
8	—	Not used
9	—	Not used

MAX-HDMI816 & HDBT816 Series

RS-232 Command Code

1-4: Message Timing Requirements

Timing Requirement	Description	Minimum (m sec)	Maximum (m sec)
Inter-byte	Time between bytes in a message packet	-	6
Inter-message	Time between consecutive message packets	300	-
Message packet time	Maximum time allowed between command receipt (entire message packet received or inter-byte	-	200
	time-out)		
Com port wait	Time between power communications.	1500	-
Error retry	Command error return.	1000	

MAX-HDMI816 & HDBT816 Series RS-232 Command Code

1-5: Message Structure

All messages will consist of a header byte, followed by optional command parameters.

There are four categories of commands as defined by the most significant two bits in the command byte.

The general format is as follows.

Descriptor	Byte Count	Value (ASCII Code), or Hex (0x)
header	1,2	SE” or “RE” (Note 1)
	3	Command Mode(Note 2)
	4	Group command length(Note 3)
GROUP	Group 1	Current setting Command ID. (Note 4)
	Group 2	Data byte length, 0x00~0xFF(total Data length x N byte)
	Group 3	Command Direct. (Note5), 0x30 = setting ,0x31 = Get
	Group 4	Command data type. (Note6)
ID	ID 1	ID code.(ID mode only)
	ID 2	Reserve byte.
	ID 3	Reserve byte.
	ID 4	Reserve byte.
Data	Data byte ...	Byte n: command data.

Note 1: Command headers -> SE: setting command header.

RE: return command header.

Note 2: Command Mode -> 0x01 standalone mode. (Without machine ID).

0x02 ID mode. (with machine ID).

Note 3: Command Group Length-> 0x04 standalone mode (without 4 byte header size)

: 0x08 ID modes :(without 4 byte machine ID)

Note 4: Command ID

Command ID	ASCII	Hex		ASCII	Hex
SYS_DEV_CLASS		0xF0		SYS_DEV_ID	0xF1
SYS_DEV_DESCRIPTION		0xF2		SYS_VER_FIRMWARE	0xF3
SYS_VER_PROTOCOL		0xF5		CMD_LOAD_INITIAL	0x01
CMD_POWER(O.P)		0x02		CMD_LOCK(O.P)	0x03
CMD_SYS_CONNECT		0x04		CMD_MAXINPUT(O.P)	0x05
CMD_MAXOUTPUT(O.P)		0x06		CMD_MACHINE_ID	0x07
CMD_HDMI_CONNECT		0x10		CMD_IO_CONNECT	0x11
CMD_BOARD_VALID		0x12		CMD_DDC_EDID	0x13

MAX-HDMI816 & HDBT816 Series

RS-232 Command Code

CMD_HDMI_STREAMING		0x14	CMD_BOARD_NAME		0x15
CMD_HDMI_CEC		0x16	CMD_EDID_MANU_NAME		0x17
CMD_EDID_DISPLAY_NAME		0x18			

Note 5:

Direct	ID
DIR_SET	0x30 (Set command to machine)
DIR_GET	0x31 (Get Command form machine)

Note 6:

data type(Data type)	ID	Note
CMD_TYPE_NONE	0x30	
CMD_TYPE_u8PORTATTRIBUTE	0x31	Note:6.1
CMD_TYPE_u16PORTATTRIBUTE	0x32	Note:6.2
CMD_TYPE_BOOLEAN	0x35	
CMD_TYPE_U8	0x36	
CMD_TYPE_STRING	0x37	Note:6.3
CMD_TYPE_NON_SUPPORTED	'!' 0x21	
CMD_ID_NON_SUPPORTED	' ' 0x20	

Note 6.1: U8 Port Attribute = Byte 1 -> Port direct. (0x30 is input port: **IP**, 0x31 is output port: **OP**).
 Byte 2 -> Port number. (0x00 is all port , 0x21 Invalid port).
 Byte 3 -> Reserve.
 Byte 4 -> Port Value.

Note 6.2: U16 Port Attribute = Byte 1 -> direct. (0x30 is input port: **IP**, 0x31 is output port: **OP**).
 Byte 2 -> Port number. (0x00 is all port).
 Byte 3 -> Port MSB byte Value.
 Byte 4 -> Port LSB byte Value.

Note 6.3: STRING = Byte 1 -> String Font start.

MAX-HDMI816 & HDBT816 Series RS-232 Command Code

2. RS232 Control Code:

All RS232 command support standalone mode and id mode.

2-1: System command

2-1.1: SYS_DEV_CLASS (0xF0)

Function: Returns the system device bytes to receive.

This command is used by application to identify the class of device.

AP will select command set according to class of device and device id.

A).Get Class: AP Send (standalone mode):

Header	GROUP	LENGTH	DIRECTION	cCMD_TYPE
'SE'+0x01+0x04	SYS_DEV_CLASS	0x00	DIR_GET	CMD_TYPE_NONE

Target acknowledges:

Header	GROUP	LENGTH	DIRECTION	cCMD_TYPE	DATA
'RE'+0x01+0x04	SYS_DEV_CLASS	0x01	DIR_GET	CMD_TYPE_U8	Class defines 0x01:matrix

B):Command example table:

Header +GROUP(cCMD_ID+LENGTH+DIRECTION+cCMD_TYPE + ID xx xx xx) + DATA(value,)				
Name	Hex code	Get/Set	Function descript	
System command id define				
SYS_DEV_CLASS (0xF0)	53 45 01 04 F0 00 31 30	Nor Get	Device class. (xx)	
	52 45 01 04 F0 01 31 36 xx	Nor Ack	Group ID mode Id	
	53 45 02 08 F0 00 31 30 ID 00 00 00	ID Get	need correct.	
	52 45 02 08 F0 01 31 36 ID 00 00 00 xx	ID Ack		

2-1.2: SYS_DEV_ID (0xF1)

Function: Get device class ID from target.

A).Get device id: AP Send (standalone mode):

Header	GROUP	LENGTH	DIRECTION	cCMD_TYPE
'SE'+0x01+0x04	SYS_DEV_ID	0x00	DIR_GET	CMD_TYPE_NONE

Target acknowledges:

Header	GROUP	LENGTH	DIRECTION	cCMD_TYPE	DATA
'RE'+0x01+0x04	SYS_DEV_ID	0x01	DIR_GET	CMD_TYPE_U8	ID defines 0x00~0xFF

MAX-HDMI816 & HDBT816 Series RS-232 Command Code

B): Command example table:

Header + GROUP(cCMD_ID+LENGTH+DIRECTION+cCMD_TYPE + ID xx xx xx) + DATA(value,)			
Name	Hex code	Get/Set	Function descript
SYS_DEV_ID (0xF1)	53 45 01 04 F1 00 31 30	Nor Get	Device class ID. (xx)
	52 45 01 04 F1 01 31 36 xx	Nor Ack	
	53 45 02 08 F1 00 31 30 ID 00 00 00	ID Get	
	52 45 02 08 F1 01 31 36 ID 00 00 00 xx	ID ACK	

2-1.3: SYS_DEV_DESCRIPTION (0xF2)

Function: Get device description from target.

A).Get: AP Send (standalone mode):

Header	GROUP	LENGTH	DIRECTION	cCMD_TYPE
'SE'+0x01+0x04	SYS_DEV_DESCRIPTOR	0x00	DIR_GET	CMD_TYPE_NONE

Target acknowledges:

Header	GROUP	LENGTH	DIRECTION	cCMD_TYPE	DATA
'RE'+0x01+0x04	SYS_DEV_DESCRIPTOR	? byte	DIR_GET	CMD_TYPE_STRING	ASCII Code string

B): Command example table:

Header + GROUP(cCMD_ID+LENGTH+DIRECTION+cCMD_TYPE +ID xx xx xx) + DATA(value,)			
Name	Hex code	Get/Set	Function descript
SYS_DEV_DESCRIPTOR (0xF2)	53 45 01 04 F2 00 31 30	Nor Get	Device DESCRIPTION string. (xx xx xx) Max 15 byte font
	52 45 01 04 F2 xx 01 31 37 xx xx xx ...	Nor Ack	
	53 45 02 08 F2 00 31 30 ID 00 00 00	ID Get	
	52 45 02 08 F2 xx 31 37 ID 00 00 00 xx xx xx ...	ID ACK	

2-1.4: SYS_SYS_VER_FIRMWARE (0xF3)

Function: Get firmware version from target.

A).Get: AP Send (standalone mode):

Header	GROUP	LENGTH	DIRECTION	cCMD_TYPE
'SE'+0x01+0x04	SYS_VER_FIRMWARE	0x00	DIR_GET	CMD_TYPE_NONE

Target acknowledges:

Header	GROUP	LENGTH	DIRECTION	cCMD_TYPE	DATA
'RE'+0x01+0x04	SYS_VER_FIRMWARE	0x01	DIR_GET	CMD_TYPE_U8	1 byte hex code firmware version.

B): Command example table:

Header + GROUP(cCMD_ID+LENGTH+DIRECTION+cCMD_TYPE +ID xx xx xx) + DATA(value,)			
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MAX-HDMI816 & HDBT816 Series

RS-232 Command Code

SYS_VER_FIRMW ARE (0xF3)	53 45 01 04 F3 00 31 30	Nor Get	Get firmware version. (xx)
	52 45 01 04 F3 01 31 36 xx	Nor Ack	
	53 45 02 08 F3 00 31 30 ID 00 00 00	ID Get	
	52 45 02 08 F3 01 31 36 ID 00 00 00 xx	ID ACK	

2-1.5: SYS_SYS_VER_SOFTWARE (0xF4)

Function: Get software version from target.

A).Get: AP Send (standalone mode):

Header	GROUP	LENGTH	DIRECTION	cCMD_TYPE
'SE'+0x01+0x04	SYS_VER_FIRMWAR E	0x00	DIR_GET	CMD_TYPE_NONE

Target acknowledges:

Header	GROUP	LENGTH	DIRECTION	cCMD_TYPE	DATA
'RE'+0x01+0x04	SYS_VER_FIRMWAR E	0x01	DIR_GET	CMD_TYPE_U8	1 byte hex code software version.

B): Command example table:

Header + GROUP(cCMD_ID+cLENGTH+DIRECTION+cCMD_TYPE +ID xx xx xx) + DATA(value,)				
SYS_VER_SOFTW ARE (0xF4)	53 45 01 04 F4 00 31 30	Nor Get	Get software version. (xx)	
	52 45 01 04 F4 01 31 36 xx	Nor Ack		
	53 45 02 08 F4 00 31 30 ID 00 00 00	ID Get		
	52 45 02 08 F4 01 31 36 ID 00 00 00 xx	ID ACK		

2-1.5: SYS_VER_PROTOCOL (0xF5)

Function: Get protocol version from target.

A).Get: AP Send (standalone mode):

Header	GROUP	LENGTH	DIRECTION	cCMD_TYPE
'SE'+0x01+0x04	SYS_VER_PROTOCO L	0x00	DIR_GET	CMD_TYPE_NONE

Target acknowledges:

Header	GROUP	LENGTH	DIRECTION	cCMD_TYPE	DATA
'RE'+0x01+0x04	SYS_VER_PROTOCO L	0x01	DIR_GET	CMD_TYPE_U8	1 byte hex code protocol.

B): Command example table:

Header + GROUP(cCMD_ID+LENGTH+DIRECTION+cCMD_TYPE +ID xx xx xx) + DATA(value,)				
SYS_VER_PROTOC OL (0xF5)	53 45 01 04 F5 00 31 30	Nor Get	Get Protocol version. (xx)	
	52 45 01 04 F5 01 31 36 xx	Nor Ack		
	53 45 02 08 F5 00 31 30 ID 00 00 00	ID Get		

MAX-HDMI816 & HDBT816 Series

RS-232 Command Code

	52 45 02 08 F5 01 31 36 ID 00 00 00 xx	ID ACK	
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2-2: Product Link command.

2-2.2: CMD_POWER (0x02)

Function: Setting/reading target machine power.

Set Command: Same CMD_TYPE_BOOL command.

A).Get: AP Send (standalone mode):

Header	GROUP	LENGTH	DIRECTION	cCMD_TYPE
'SE'+0x01+0x04	CMD_POWER	0x00	DIR_GET	CMD_TYPE_NONE

Target acknowledges:

Header	GROUP	LENGTH	DIRECTION	cCMD_TYPE	DATA
'RE'+0x01+0x04	CMD_POWER	0x01	DIR_GET	CMD_TYPE_US	0x01 Power on 0x00 Power off

B): Command example table:

Header + GROUP(cCMD_ID+LENGTH+DIRECTION+cCMD_TYPE +ID xx xx xx) + DATA(value,)			
CMD_POWER (0x02)	53 45 01 04 02 00 31 30	Nor Get	power target (xx)
	52 45 01 04 02 01 31 36 xx	Nor Ack	0 = power off.
	53 45 02 08 02 00 31 30 ID 00 00 00	ID Get	1 = power on.
	52 45 02 08 02 01 31 36 ID 00 00 00 xx	ID ACK	
	53 45 01 04 02 01 30 36 xx	Nor Set	
	52 45 01 04 02 01 30 36 xx	Ack	
	53 45 02 08 02 01 30 36 ID 00 00 00 xx	ID Set	
	52 45 02 08 02 01 30 36 ID 00 00 00 xx	ID ACK	

2-2.3: CMD_KEY_LOCK(0x03)

Function: Setting/reading Front Key panel Lock.

Set Command: Same CMD_TYPE_BOOL command.

A).Get: AP Send (standalone mode):

Header	GROUP	LENGTH	DIRECTION	cCMD_TYPE
'SE'+0x01+0x04	CMD_KEY_LOCK	0x00	DIR_GET	CMD_TYPE_NONE

Target acknowledges:

Header	GROUP	LENGTH	DIRECTION	cCMD_TYPE	DATA
'RE'+0x01+0x04	CMD_KEY_LOCK	0x01	DIR_GET	CMD_TYPE_US	0x01 Lock on 0x00 Lock off

B): Command example table:

MAX-HDMI816 & HDBT816 Series RS-232 Command Code

Header + GROUP(cCMD_ID+LENGTH+DIRECTION+cCMD_TYPE +ID xx xx xx) + DATA(value,)			
CMD_KEY_LOCK (0x03)	53 45 01 04 03 00 31 30	Nor Get	Key lock target (xx) 0 = Lock off. 1 = Lock on.
	52 45 01 04 03 01 31 36 xx	Nor Ack	
	53 45 02 08 03 00 31 30 ID 00 00 00	ID Get	
	52 45 02 08 03 01 31 36 ID 00 00 00 xx	ID ACK	
	53 45 01 04 03 01 30 36 xx	Nor Set	
	52 45 01 04 03 01 30 36 xx	Ack	
	53 45 02 08 03 01 30 36 ID 00 00 00 xx	ID Set	
	52 45 02 08 03 01 30 36 ID 00 00 00 xx	ID ACK	

2-2.4: CMD_SYS_CONNECT (0x04).

Function: connect system with target, ever 10~15 sec, send 1 cycle link command for make sure system connection.

A).Set: AP Send (standalone mode):

Header	GROUP	LENGTH	DIRECTION	cCMD_TYPE	DATA
'SE'+0x01+0x04	CMD_SYS_CONNECT	0x01	DIR_SET	CMD_TYPE_U8	

Target acknowledges:

Header	GROUP	LENGTH	DIRECTION	cCMD_TYPE	DATA
'RE'+0x01+0x04	CMD_SYS_CONNECT	0x01	DIR_SET	CMD_TYPE_U8	0x01 connect 0x00 disconnect

B): Command example table:

Header + GROUP(cCMD_ID+LENGTH+DIRECTION+cCMD_TYPE +ID xx xx xx) + DATA(value,)			
CMD_SYS_CONNEC T (0x04)	53 45 01 04 04 00 31 30	Nor Get	Connect target (xx) 0 = disconnect. 1 = connect to target.
	52 45 01 04 04 01 31 36 xx	Nor Ack	
	53 45 02 08 04 00 31 30 ID 00 00 00	ID Get	
	52 45 02 08 04 01 31 36 ID 00 00 00 xx	ID ACK	
	53 45 01 04 04 01 30 36 xx	Nor Set	
	52 45 01 04 04 01 30 36 xx	Ack	
	53 45 02 08 04 01 30 36 ID 00 00 00 xx	ID Set	
	52 45 02 08 04 01 30 36 ID 00 00 00 xx	ID ACK	

2-2.5: CMD_MAXINPUT (0x05 Get only)

Function: Target support Max input port.

A).Get: AP Send (standalone mode):

Header	GROUP	LENGTH	DIRECTION	cCMD_TYPE
'SE'+0x01+0x04	CMD_MAXINPUT	0x00	DIR_GET	CMD_TYPE_NONE

Target acknowledges:

MAX-HDMI816 & HDBT816 Series

RS-232 Command Code

Header	GROUP	LENGTH	DIRECTION	cCMD_TYPE	DATA
'RE'+0x01+0x04	CMD_MAXINPUT	0x01	DIR_GET	CMD_TYPE_U8	1~20 source

B): Command example table:

Header + GROUP(cCMD_ID+LENGTH+DIRECTION+cCMD_TYPE +ID xx xx xx) + DATA(value,)			
CMD_MAXINPUT (0x05)	53 45 01 04 05 00 31 30	Nor Get	Max source (xx)
	52 45 01 04 05 01 31 36 xx	Nor Ack	0 = None.
	53 45 02 08 05 00 31 30 ID 00 00 00	ID Get	1~40 = max support
	52 45 02 08 05 01 31 36 ID 00 00 00 xx	ID ACK	source.

2-2.5: CMD_MAXOUTPUT (0x06 Get only)

Function: Target support Max output source.

A).Get: AP Send (standalone mode):

Header	GROUP	LENGTH	DIRECTION	cCMD_TYPE
'SE'+0x01+0x04	CMD_MAXOUTPUT	0x00	DIR_GET	CMD_TYPE_NONE

Target acknowledges:

Header	GROUP	LENGTH	DIRECTION	cCMD_TYPE	DATA
'RE'+0x01+0x04	CMD_MAXOUTPUT	0x01	DIR_GET	CMD_TYPE_U8	1~20 source

B): Command example table:

Header + GROUP(cCMD_ID+LENGTH+DIRECTION+cCMD_TYPE +ID xx xx xx) + DATA(value,)			
CMD_MAXOUTPUT (0x06)	53 45 01 04 06 00 31 30	Nor Get	Max source (xx)
	52 45 01 04 06 01 31 36 xx	Nor Ack	0 = None.
	53 45 02 08 06 00 31 30 ID 00 00 00	ID Get	1~40 = max support
	52 45 02 08 06 01 31 36 ID 00 00 00 xx	ID ACK	source.

2-2.7: CMD_MACHINE_ID (0x07)

Function: Set/Get Target machine id code.

A).Set: AP Send (standalone mode):

Header	GROUP	LENGTH	DIRECTION	cCMD_TYPE	DATA
'SE'+0x01+0x04	CMD_MACHINE_ID	0x01	DIR_SET	CMD_TYPE_U8	

Target acknowledges:

Header	GROUP	LENGTH	DIRECTION	cCMD_TYPE	DATA
'RE'+0x01+0x04	CMD_MACHINE_ID	0x01	DIR_SET	CMD_TYPE_U8	1 byte ID code

B): Command example table:

Header + GROUP(cCMD_ID+cLENGTH+DIRECTION+cCMD_TYPE +ID xx xx xx) + DATA(value,)			
CMD_MACHINE_ID (0x07)	53 45 01 04 07 00 31 30	Nor Get	Id code(xx)
	52 45 01 04 07 01 31 36 xx	Nor Ack	
	53 45 02 08 07 00 31 30 ID 00 00 00	ID Get	

MAX-HDMI816 & HDBT816 Series

RS-232 Command Code

	52 45 02 08 07 01 31 36 ID 00 00 00 xx	ID ACK	
	53 45 01 04 07 01 30 36 xx	Nor Set	
	52 45 01 04 07 01 30 36 xx	Ack	
	53 45 02 08 07 01 30 36 ID 00 00 00 xx	ID Set	
	52 45 02 08 07 01 30 36 ID 00 00 00 xx	ID CK	

2-2.8: CMD_LOAD_INITIAL (0x01).

Function: Load all data form target.

Set Command:

AP Send:

'SE'+ 0x01+0x04 + 0 + DIR_GET + CMD_LOAD_INITIAL + CMD_TYPE_NONE

Target acknowledges:

'RE'+ 0x01+0x04 + 0+ DIR_GET + CMD_LOAD_INITIAL + CMD_TYPE_NON + Send ALL USER data.

Header + GROUP(cCMD_ID+cLENGTH+DIRECTION+cCMD_TYPE +ID xx xx xx) + DATA(value,)			
CMD_LOAD_INITIAL (0x01)	53 45 01 04 01 00 31 30	Nor Get	continue send all machine data to AP. (xx) xx= 0 start initial xx=1 last initial
	52 45 01 04 01 00 31 36 xx	Nor Ack	
	53 45 02 08 01 00 31 30 ID 00 00 00	ID Get	
	52 45 02 08 01 00 31 30 ID 00 00 00 xx	ID ACK	

Load initial RS232 Set

RET > CMD_LOAD_INITIAL(0x00)

SET RS232 CMD

1.1.SYS_DEV_DESCRIPTION

1.2, CMD_MAXOUTPUT, CMD_MAXINPUT

1.3. CMD_POWER,

1.4 CMD_LOCK

1.5. CMD_MACHINE_ID

1.6. CMD_BOARD_VALID

1.7, CMD_HDMI_CONNECT

1.8 CMD_IO_CONNECT

1.9, CMD_HDMI_STREAMING

2.0, CMD_BOARD_NAME

RET -> CMD_LOAD_INITIAL (0x01)

MAX-HDMI816 & HDBT816 Series

RS-232 Command Code

2-3: Product control command.

2-3.1: CMD_HDMI_CONNECT (0x10)

Function: setting target Tx(output 1~20) source. 0x21: HDMI_PORT_INVALID

A).Set: AP Send (standalone mode):

Header	GROUP	LENGTH	DIRECTION	cCMD_TYPE	DATA
'SE'+0x01+0x04	CMD_HDMI_CONNEC T	0x04	DIR_SET	CMD_TYPE_u8 PORTATTRIBU TE	+Tx Port direct +Tx Port number + Reserve + Rx connections

Target acknowledges:

Header	GROUP	LENGTH	DIRECTION	cCMD_TYPE	DATA
'RE'+0x01+0x04	CMD_HDMI_CONNEC T	0x04	DIR_SET	CMD_TYPE_u8 PORTATTRIBU TE	+Tx Port direct +Tx Port number + Reserve + Rx connections

B).Get: AP Send (standalone mode):

Header	GROUP	LENGTH	DIRECTION	cCMD_TYPE	DATA
'SE'+0x01+0x04	CMD_HDMI_CONNEC T	0x04	DIR_GET	CMD_TYPE_u8 PORTATTRIBU TE	+Tx Port direct +Tx Port number + Reserve + Rx connections

Target acknowledges:

Header	GROUP	LENGTH	DIRECTION	cCMD_TYPE	DATA
'RE'+0x01+0x04	CMD_HDMI_CONNEC T	0x04	DIR_GET	CMD_TYPE_u8 PORTATTRIBU TE	+Tx Port direct +Tx Port number + Reserve + Rx connections

C): Command example table:

Header+GROUP(cCMD_ID+LENGTH+DIRECTION+cCMD_TYPE+ID xx xx xx) +DATA(Port direct ,Port Number , Reserve , Set Value...)			
Name	Hex code	Get/Set	Function descript
CMD_HDMI_CONN	53 45 01 04 10 04 31 31 31 01 yy XX	Nor Get	Read HDMI RX correct

MAX-HDMI816 & HDBT816 Series

RS-232 Command Code

ECT (0x10)	52 45 01 04 10 04 31 31 31 01 yy XX	Nor Ack	port connect value(XX)
A) Single Read: Tx Port 1 connect to Rx Port 2 Read output Tx Port 1,Normal mode			
AP Send	Target get acknowledges:		
53 45 01 04 10 04 31 31 31 01 00 00	52 45 01 04 10 04 31 31 31 01 00 02		
B) Rand Read :Tx 1 -> Rx 2 , Tx 2 -> Rx 3, Read Out Tx1,2, ID mode, ID =1			
AP Send	Target get acknowledges:		
53 45 02 08 10 08 31 31 01 00 00 00 31 01 00 00 31 02 00 00	52 45 02 08 10 08 31 31 01 00 00 00 31 01 00 02 31 02 00 03		
C) Example: Set Tx output port 1 connect to Rx input Port 2			
AP Send	Target get acknowledges:		
53 45 01 04 10 04 30 31 31 01 00 02	52 45 01 04 10 04 30 31 31 01 00 02		
D) Example: Read (all port), Set all port is same command format!			
AP Send	Target get acknowledges:		
53 45 01 04 10 04 31 31 31 00 00 00	52 45 01 04 10 xx 31 31 31 01 00 xx 31 02 00 xx.....		
E) Example: Set (Fellow I/O mode), Set TX 1 fellow IO1(if IO1 as connect to RX2)			
AP Send	Target get acknowledges:		
53 45 01 04 10 04 30 31 31 01 01 xx	52 45 01 04 10 04 30 31 31 01 01 02		

Data struct define:

Byte 1 -> Port direct. (0x30 is input port:IP,0x31 is output port: OP).

Byte 2 -> Port number.(0x00 is all port)(1~16 port connect number)(0x21:invalid port)

Byte 3 ->Reserve. (Support direct SET mode only, direct get mode ignore this byte)

-> Bit 0 = 0-> Get Rx port number form Byte 4.

-> Bit 0 = 1-> Fellow mode Get Rx port number fellow I/O (CMD_IO_CONNECT)
connects setting.

Byte 4: Rx port number(0x00 is all port) (If Byte 3 setting to Fellow mode, ignore byte 4)

2-3.2: CMD_IO_CONNECT (0x11)

Function: setting target IO connect source.

Set Command: Same CMD_IHDMI_CONNECT Format.

Rand Read ,Write, ID Read Write : Same CMD_IHDMI_CONNECT Format.

Header+GROUP(cCMD_ID+cLENGTH+DIRECTION+cCMD_TYPE+ID xx xx xx) +DATA(Port direct ,Port Number , Resever , Set Value...)			
Name	Hex code	Get/Set	Function descript
CMD_IO_CONNECT (0x11)	53 45 01 04 11 04 31 31 31 01 yy XX	Nor Get	Read IO RX correct port connects value (XX).
	52 45 01 04 11 04 31 31 31 01 yy XX	Nor Ack	
	53 45 02 08 11 00 31 30 ID 00 00 00 31 01 yy XX	ID Get	

MAX-HDMI816 & HDBT816 Series

RS-232 Command Code

	52 45 02 08 11 00 31 30 ID 00 00 00 31 01 yy XX	ID ACK	
A) Single: Tx Port 1 IO connect fellow HDMI ,(if HDMI ->RX1),Normal mode			
AP Send	Target get acknowledges:		
53 45 01 04 11 04 30 31 31 01 01 xx	52 45 01 04 11 04 31 31 31 01 01 01		
B) Example: Set Tx output port 1 connect to Rx input Port 2			
AP Send	Target get acknowledges:		
53 45 01 04 11 04 30 31 31 01 00 02	52 45 01 04 11 04 30 31 31 01 00 02		

Data struct define:

Byte 1 -> Port direct. (0x30 is input port:IP,0x31 is output port: OP).

Byte 2 -> Port number.(0x00 is all port)0~16.

Byte 3 ->Reserve. (Support direct SET mode only , direct get mode ignore this byte)

-> Bit 0 = 0-> Get Rx port number form Byte 4.

-> Bit 0 = 1-> Fellow mode Get Rx port number fellow HDMI (CMD_HDMI_CONNECT)
connects setting.

Byte 4: Rx port number(0x00 is all port) (If Byte 3 setting to Fellow mode, ignore byte 4)

**Note: !!!!! RS232 command “CMD_IO_CONNECT” without check only One TX can
be connect to one RX (allow one TX IO connect to many RX IO)!!!!!!**

2-3.3: CMD_BOARD_VALID (0x12)

Function: Read or setting target board valid status.

Set Command: Same CMD_IHDMI_CONNECT command.

B).Get: AP Send (standalone mode):

Header	GROUP	LENGTH	DIRECTION	cCMD_TYPE	DATA
'SE'+0x01+0x04	CMD_BOARD_VALID	0x04	DIR_GET	CMD_TYPE_u8 PORTATTRIBU TE	+ Port direct + Port number + Reserve + Value

Target acknowledges:

Header	GROUP	LENGTH	DIRECTION	cCMD_TYPE	DATA
'RE'+0x01+0x04	CMD_BOARD_VALID	0x04	DIR_GET	CMD_TYPE_u8 PORTATTRIBU TE	+ Port direct + Port number + Reserve + Value

Value define: 0x01 valid

0x00 invalid

MAX-HDMI816 & HDBT816 Series

RS-232 Command Code

Header+GROUP(cCMD_ID+LENGTH+DIRECTION+cCMD_TYPE+ID xx xx xx) +DATA(Port direct ,Port Number , Resever , Set Value...)			
Name	Hex code	Get/Set	Function descript
CMD_BOARD_VALID (0x12)	53 45 01 04 12 04 31 31 31 01 yy XX	Nor Get	Read RX/Tx port valid (XX).
	52 45 01 04 12 04 31 31 31 01 yy XX	Nor Ack	
	53 45 02 08 11 00 31 30 ID 00 00 00 31 01 yy XX	ID Get	
	52 45 02 08 11 00 31 30 ID 00 00 00 31 01 yy XX	ID ACK	

2-3.4: CMD_DDC_EDID (0x13)

Function: Read or setting DDC buffer data.

Set Command:

B).Get: AP Send (standalone mode):

Header	GROUP	LENGTH	DIRECTION	cCMD_TYPE	DATA
'SE'+0x01+0x04	CMD_DDC_EDID	0x04	DIR_GET	CMD_TYPE_u8 PORTATTRIBU TE	+ Port direct + Port number + Reserve + Value

Target acknowledges:

Header	GROUP	LENGTH	DIRECTION	cCMD_TYPE	DATA
'RE'+0x01+0x04	CMD_DDC_EDID	0x04	DIR_GET	CMD_TYPE_u8 PORTATTRIBU TE	+ Port direct + Port number + Reserve + status +DDC

EDID MAP define:

Byte 1 -> Port direct. (0x30 is input port:IP,0x31 is output port: OP).

Byte 2 -> Port number.(0x00 is all port)0~16.

Byte 3 -> Bit 0 = 0-> Bank 0.

Bit 0 = 1 -> Bank 1.

Bit 1 = 0 -> DDC RAM

Bit 1 = 1 -> EEPROM.

Bit 2~BIT3:00 = RxD DDC

:10 = Tx A DDC

:11= Tx B DDC

Byte 4 -> return status. 0x01: Data false.

0x00: read or Write success.

0x02: No support.

MAX-HDMI816 & HDBT816 Series

RS-232 Command Code

Header+GROUP(cCMD_ID+LENGTH+DIRECTION+cCMD_TYPE+ID xx xx xx) +DATA(Port direct ,Port Number , Reserve , Set Value...)			
Name	Hex code	Get/Set	Function descript
CMD_DDC_EDID (0x13)	53 45 01 04 13 04 31 31 30 02 00 00	Nor Get	Read/Write RX/Tx port
	52 45 01 04 13 04 31 31 30 02 00 XX 128 Byte	Nor Ack	DDC data (XX).
	53 45 02 08 13 04 31 30 ID 00 00 00 31 01 00 00	ID Get	
	52 45 02 08 13 84 31 30 ID 00 00 00 31 01 00 xx	ID ACK	
A) Single Read: Rx Port RXD DDC EEP ROM bank 0 data ,Normal mode			
AP Send		Target get acknowledges:	
53 45 01 04 13 04 31 31 30 01 02 00		52 45 01 04 10 04 31 31 31 01 02 02 128 Byte data	
B) Single Read: Tx Port 1 RXD DDC EEP ROM data bank 0,Normal mode			
AP Send		Target get acknowledges:	
53 45 01 04 13 04 31 31 31 01 02 00		52 45 01 04 10 04 31 31 31 01 02 02 128 Byte data	
C) Example: Set: Tx Port 1 RXD DDC EEP ROM data ,Normal mode			
AP Send		Target get acknowledges:	
53 45 01 04 13 84 30 31 31 01 02 00			

SAMSUNG 1080P TV DDC

00 FF FF FF FF FF FF 00 4C 2D 02 09 00 00 00 00 29 15 01 03 80 46 27 78 0A EE 91 A3 54 4C 99 26 0F
50 54 BD EF 80 71 4F 81 C0 81 00 81 80 95 00 A9 C0 B3 00 01 01 02 3A 80 18 71 38 2D 40 58 2C 45 00
A0 5A 00 00 00 1E 66 21 56 AA 51 00 1E 30 46 8F 33 00 A0 5A 00 00 00 1E 00 00 00 FD 00 18 4B 0F
51 17 00 0A 20 20 20 20 20 20 00 00 00 FC 00 53 41 4D 53 55 4E 47 0A 20 20 20 20 20 01 61

02 03 25 F1 4D 90 1F 04 13 05 14 03 12 20 21 22 07 16 23 09 07 07 83 01 00 00 E2 00 0F 67 03 0C 00 20
00 B8 2D 01 1D 80 D0 72 1C 16 20 10 2C 25 80 A0 5A 00 00 00 9E 01 1D 80 18 71 1C 16 20 58 2C 25
00 A0 5A 00 00 00 9E 01 1D 00 BC 52 D0 1E 20 B8 28 55 40 A0 5A 00 00 00 1E 01 1D 00 72 51 D0 1E
20 6E 28 55 00 A0 5A 00 00 00 1E 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 CE

2-3.5: CMD_HDMI_STREAMING(0x14)

Function: Read target _HDMI_UpDn_STREAMING status.

Set Command: Same CMD_TYPE_u8PORTATTRIBUTE command.

A).Get: AP Send (standalone mode):

Header	GROUP	LENGTH	DIRECTION	cCMD_TYPE	DATA
'SE'+0x01+0x04	CMD_HDMI_STREAMING	0x04	DIR_GET	CMD_TYPE_u8 PORTATTRIBU TE	+ Port direct + Port number + Reserve + Value

Target acknowledges:

MAX-HDMI816 & HDBT816 Series RS-232 Command Code

Header	GROUP	LENGTH	DIRECTION	cCMD_TYPE	DATA
'RE'+0x01+0x04	CMD_HDMI_STREAMING	0x04	DIR_GET	CMD_TYPE_u8 PORTATTRIBUTE	+ Port direct + Port number + Reserve + Value

Reserve :Bit 2~BIT3:00 = Rx D DDC
:10 = Tx A DDC
:11= Tx B DDC

Value define: Bit 3 = 1 Link
Bit 3 = 0 un-Link
Bit 4 = 1 HDCP
Bit 4 = 0 No HDCP

Header+GROUP(cCMD_ID+cLENGTH+DIRECTION+cCMD_TYPE+ID xx xx xx) +DATA(Port direct ,Port Number , Resever , Set Value...)			
Name	Hex code	Get/Set	Function descript
CMD_HDMI_STREAMING (0x14)	53 45 01 04 14 04 31 31 30 02 00 00	Nor Get	Read RX/Tx port streaming status (XX).
	52 45 01 04 14 04 31 31 31 02 00 XX	Nor Ack	
	53 45 02 08 14 04 31 30 ID 00 00 00 31 01 00 00	ID Get	
	52 45 02 08 14 84 31 30 ID 00 00 00 31 01 00 xx	ID ACK	
A) Single Read: Rx Port 1 STREAMING data, Normal mode			
AP Send	Target get acknowledges:		
53 45 01 04 14 04 31 31 30 01 00 XX	52 45 01 04 14 04 31 31 31 01 00 XX		
B) Single Read: Tx Dn Port 1 STREAMING data ,Normal mode			
AP Send	Target get acknowledges:		
53 45 01 04 14 04 31 31 31 01 00 XX	52 45 01 04 14 04 31 31 31 01 00 XX		
C) Example: Set: Tx Dn Port 1 STREAMING data ,Normal mode			
AP Send	Target get acknowledges:		
53 45 01 04 14 04 30 31 31 01 00 0F			

2-3.6: CMD_BOARD_NAME (0x15)

Function: Read or setting target board Name String(support single read/write only).
Set Command: Same CMD_BOARD_NAME command.

A).Get: AP Send (standalone mode):

Header	GROUP	LENGTH	DIRECTION	cCMD_TYPE	DATA
'SE'+0x01+0x04	CMD_BOARD_NAME	0x04	DIR_GET	CMD_TYPE_u8 PORTATTRIBUTE	+ Port direct + Port number + Reserve

MAX-HDMI816 & HDBT816 Series

RS-232 Command Code

					+ Reserve
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Target acknowledges:

Header	GROUP	LENGTH	DIRECTION	cCMD_TYPE	DATA
'RE'+0x01+0x04	CMD_BOARD_NAME	0x04	DIR_GET	CMD_TYPE_u8 PORTATTRIBU TE	+ Port direct + Port number + Reserve + status + name

Board name support: max 12 Byte

Byte 3 -> Reserve Bit 01 : 00 -> Read board name form Plug board MCU RAM

01 -> Read board name form Main board MCU RAM

Byte 4 -> return status. 0x01: Data false.

0x00: read or Write success.

0x02: No support.

Header+GROUP(cCMD_ID+cLENGTH+DIRECTION+cCMD_TYPE+ID xx xx xx) +DATA(Port direct ,Port Number , Reserve , Type)			
Name	Hex code	Get/Set	Function descript
CMD_BOARD_NAME (0x15)	53 45 01 04 15 04 31 31 31 02 00 00	Nor Get	Read RX/Tx port Board name string (12 Byte).
	52 45 01 04 15 10 31 31 31 02 00 00+12 Byte	Nor Ack	
	53 45 02 08 15 04 31 30 ID 00 00 00 31 01 00 00	ID Get	
	52 45 02 08 15 10 31 30 ID 00 00 00 31 01 00 00+12 Byte	ID ACK	
A) Single Read: Rx Port 1 Name data,Normal mode			
AP Send	Target get acknowledges:		
53 45 01 04 15 04 31 31 30 01 00 00	52 45 01 04 15 10 31 31 31 01 00 00+12 Byte		
B) Single Read: Tx Dn Port 1 Name data ,Normal mode			
AP Send	Target get acknowledges:		
53 45 01 04 15 04 31 31 31 01 00 00	52 45 01 04 15 10 31 31 31 01 00 00+12 Byte		
C) Example: Set: Tx Dn Port 1 Name data ,Normal mode			
AP Send	Target get acknowledges:		
53 45 01 04 15 10 30 31 31 01 00 00 +12 Byte 40 40 40 40 40 40 40 40 40 40 40 40	53 45 01 04 14 10 30 31 31 01 00 00+12 Byte		

2-3.7: CMD_HDMI_CEC(0x16)

Function: Read/Set target HDMI_UpDn_STREAMING CEC status.

Set Command: Same CMD_TYPE_u8PORTATTRIBUTE command.

A).Get: AP Send (standalone mode):

Header	GROUP	LENGTH	DIRECTION	cCMD_TYPE	DATA
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MAX-HDMI816 & HDBT816 Series

RS-232 Command Code

'SE'+0x01+0x04	CMD_HDMI_CEC	0x04	DIR_SET	CMD_TYPE_u8 PORTATTRIBU TE	+ Port direct + Port number + Reserve + CEC CMD
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Target acknowledges:

Header	GROUP	LENGTH	DIRECTION	cCMD_TYPE	DATA
'RE'+0x01+0x04	CMD_HDMI_CEC	0x04	DIR_SET	CMD_TYPE_u8 PORTATTRIBU TE	+ Port direct + Port number + Reserve + Value

Reserve :Bit 0~BIT1:00 = RxD CEC
:01 = Tx A CEC
:10= Tx B CEC

VALUE CEC ID table

0	CEC NONE	1	One touch play
2	StandBy	3	One touch play(with retry and makesure power status correct)
4	StandBy (with retry and make sure power status correct)	5	GiveDevicePowerStatus(T.B.D.)

Header+GROUP(cCMD_ID+cLENGTH+DIRECTION+cCMD_TYPE+ID xx xx xx) +DATA(Port direct ,Port Number , Reserve , Set Value...)

Name	Hex code	Get/Set	Function descript
CMD_HDMI_CEC (0x16)	53 45 01 04 16 04 30 31 31 02 01 xx	Nor Get	Set RX/Tx port CEC status(XX CEC CMD).
	52 45 01 04 16 04 30 31 31 02 01 xx	Nor Ack	
	53 45 02 08 16 04 30 31 ID 00 00 00 31 02 00 xx	ID Get	
	52 45 02 08 16 84 30 31 ID 00 00 00 31 02 00 xx	ID ACK	

A) Single Set: Tx Port 1 A CEC one touch play

AP Send	Target get acknowledges:
53 45 01 04 16 04 31 31 31 01 01 01	52 45 01 04 16 04 31 31 31 01 01 01

2-3.8: CMD_EDID_MANU_NAME (0x17)

Function: Read target board EDID MANUFACTURE Name String.

A).Get: AP Send (standalone mode):

MAX-HDMI816 & HDBT816 Series

RS-232 Command Code

Header	GROUP	LENGTH	DIRECTION	cCMD_TYPE	DATA
'SE'+0x01+0x04	CMD_EDID_MANU_N AME	0x04	DIR_GET	CMD_TYPE_u8 PORTATTRIBU TE	+ Port direct + Port number + RX, TXA, TXB + Reserve

Target acknowledges:

Header	GROUP	LENGTH	DIRECTION	cCMD_TYPE	DATA
'RE'+0x01+0x04	CMD_EDID_MANU_N AME	0x04	DIR_GET	CMD_TYPE_u8 PORTATTRIBU TE	+ Port direct + Port number + RX, TXA, TXB + status + name

EDID manufacture name support: max 3 Byte

Byte 3 :Bit 2~BIT3: 00 = Rx D DDC
: 10 = Tx A DDC
: 11 = Tx B DDC

Byte 4 -> return status. 0x01: Data false.

0x00: read or Write success.

0x02: No support.

Header+GROUP(cCMD_ID+cLENGTH+DIRECTION+cCMD_TYPE+ID xx xx xx) +DATA(Port direct ,Port Number , Reserve , Type)			
Name	Hex code	Get/Set	Function descript
CMD_EDID_MANU_N AME (0x17)	53 45 01 04 17 04 31 31 31 02 00 00	Nor Get	Read RX/Tx port EDID manufacture name string (3 Byte).
	52 45 01 04 17 07 31 31 31 02 00 00+3 Byte	Nor Ack	
	53 45 02 08 17 04 31 30 ID 00 00 00 31 01 00 00	ID Get	
	52 45 02 08 17 07 31 30 ID 00 00 00 31 01 00 00+3 Byte	ID ACK	
A) Single Read: Rx Port 1 RXDDC EDID manufacture name ,Normal mode			
AP Send		Target get acknowledges:	
53 45 01 04 17 04 31 31 30 01 00 00		52 45 01 04 17 07 31 31 31 01 00 00+3 Byte	
B) Single Read: Tx Dn Port 1 TXA DDC EDID manufacture name ,Normal mode			
AP Send		Target get acknowledges:	
53 45 01 04 17 04 31 31 31 01 04 00		52 45 01 04 17 07 31 31 31 01 04 00+3 Byte	

2-3.9: CMD_EDID_DISPLAY_NAME (0x18)

Function: Read target board EDID Display Name String.

A).Get: AP Send (standalone mode):

MAX-HDMI816 & HDBT816 Series

RS-232 Command Code

Header	GROUP	LENGTH	DIRECTION	cCMD_TYPE	DATA
'SE'+0x01+0x04	CMD_EDID_DISPLAY _NAME	0x04	DIR_GET	CMD_TYPE_u8 PORTATTRIBU TE	+ Port direct + Port number + RX, TXA, TXB + Reserve

Target acknowledges:

Header	GROUP	LENGTH	DIRECTION	cCMD_TYPE	DATA
'RE'+0x01+0x04	CMD_EDID_DISPLAY _NAME	0x04	DIR_GET	CMD_TYPE_u8 PORTATTRIBU TE	+ Port direct + Port number + RX, TXA, TXB + status + name

EDID manufacture name support: max 3 Byte

Byte 3 :Bit 2~BIT3: 00 = Rx D DDC

: 10 = Tx A DDC

: 11 = Tx B DDC

Byte 4 -> return status. 0x01: Data false.

0x00: read or Write success.

0x02: No support.

Header+GROUP(cCMD_ID+cLENGTH+DIRECTION+cCMD_TYPE+ID xx xx xx) +DATA(Port direct ,Port Number , Reserve , Type)			
Name	Hex code	Get/Set	Function descript
CMD_EDID_DISPLAY _NAME (0x18)	53 45 01 04 18 04 31 31 31 02 00 00	Nor Get	Read RX/Tx port EDID display name string (13 Byte).
	52 45 01 04 18 11 31 31 31 02 00 00+13 Byte	Nor Ack	
	53 45 02 08 18 04 31 30 ID 00 00 00 31 01 00 00	ID Get	
	52 45 02 08 18 11 31 30 ID 00 00 00 31 01 00 00+3 Byte	ID ACK	
A) Single Read: Rx Port 1 RXDDC EDID display name ,Normal mode			
AP Send	Target get acknowledges:		
53 45 01 04 18 04 31 31 30 01 00 00	52 45 01 04 18 11 31 31 31 01 00 00+3 Byte		
B) Single Read: Tx Dn Port 1 TXA DDC EDID display name ,Normal mode			
AP Send	Target get acknowledges:		
53 45 01 04 18 04 31 31 31 01 04 00	52 45 01 04 18 11 31 31 31 01 04 00+3 Byte		

MAX-HDMI816 & HDBT816 Series

RS-232 Command Code

2-4: Un-support control command.

Header + GROUP(cCMD_ID+cLENGTH+DIRECTION+cCMD_TYPE) + DATA			
Name	Hex code	Get/Set	Function descript
No Support command.			
No support Type	53 45 01 04 xx 00 31 xx	Get/set	No support Type.
	52 45 01 04 xx 00 31 32	ACK	
No support Command	53 45 02 08 xx 00 31 30 xx xx xx xx	Get/set	No support command.(CMD_ID xx)
	52 45 02 08 xx 00 31 33 xx xx xx xx	ACK	
Data range or format error	53 45 02 08 xx 00 31 34 xx xx xx xx	Get/set	No support format.(CMD_ID xx)