

444K-8x8-L RS232 Control Protocol

Document Conventions & Definitions

All commands are shown in ASCII

Angle brackets (and anything within them) <> represent 1 byte of data.

Port Configuration

These are the settings that are required for successful communication with a 444K matrix.

Serial port control:

Baud Rate: 115200

Data Bits: 8

Parity: None

Stop Bits: 1

Command Structure

The general structure of commands to be sent to the matrix is detailed below:

#X_d ab h=k

The general format is:

- 1) X = Function select
- 2) d = Operating parameter
- 3) a = Input/output select
- 4) b = Channel Number (1-8, 0=all)
- 5) h = Property parameter
- 6) k = Property value

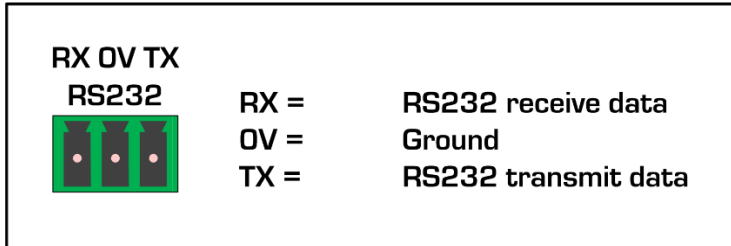
Please note this structure does vary dependent on the type of command being executed. Each command type is provided with an example instruction throughout this document.

Commands are applicable for all variants of matrix and cards within the 444K range

Establishing communication

Once a serial cable has been attached from the 444K-8x8-L unit to a control device (i.e. PC, laptop or 3rd party control system) and mains power applied the link is active. Simply enable the port from the control device and the 444K-8x8-L will accept incoming commands.

RS232 Port – Pin Functions



Commands

Control of the 444K-8x8-L matrix can be broken down in to the following 5 categories:

1. General System Commands
2. Audio Control
3. EDID Management
4. Crosspoint Control
5. IP Port Configuration

The tables below step through each of these command types in turn providing command examples

1. General System Commands

Function	Command Example	Response	Description
Product info	#system help	#####SYSTEM STR##### #Company : Smart-e #Type : 444K-8x8-L #Release : 1V1 #Debug : 1T7 #Web : www.smart-e.co.uk #E-mail : sales@smart-e.co.uk #Tell : 00441306628264 #Build : 19-03-07 15:11:12 #ID : 61E0D42C #####SYSTEM END#####	Obtain product information including model number, software version, build date and internal serial number
Reset to factory default	#factory	Reset system. Eeprom reset to user. Clear group 1 dat. Clear group 2 dat. Clear group 3 dat. Clear group 4 dat. Clear group 5 dat. Clear group 6 dat. Clear group 7 dat. Clear group 8 dat #####IP STR##### #DHCP : off #IP : 192.168.1 .168 #MASK : 255.255.255.0 #GW : 192.168.1 .1 #DNS : 144.144.144.144 #MAC : 00:08:DC:E0:D4:2C #Netbios : WEB #####IP END#####	Restore the unit to factory defaults
Backlight shut down settings	#lcd shut=60	LCD backlight level:8 LCD backlight shut time:60s LCD back to the main time:20s	Set the amount of time the LCD backlight on the front panel remains on after a command. Time in seconds Range 1-3599 3600 - never
Backlight level settings	#lcd level=8	LCD backlight level:8 LCD backlight shut time:60s LCD back to the main time:20s	Set the backlight level for the LCD. Range 1-10
Backlight time back to menu settings	#lcd main=20	LCD backlight level:8 LCD backlight shut time:60s LCD back to the main time:20s	Set the amount of time the LCD remains on current view before returning to main

			view. Time in seconds. Range 10-599 600 - never
Query backlight settings	#lcd level=help	LCD backlight level:8 LCD backlight shut time:60 s LCD back to the main time:20 s	Check the current status of LCD
RS232 set baud rate	#uart0 baud=9600	Uart baud change from 115200 to 9600. Please change the baud rate of this software synchronously	Change the baud rate of the RS232 port on the rear of the 444K-8x8-L to 9600. Range 2400 – 115200
RS232 bypass	#uart0 bypass=3	Uart DB9 bypass to HDBT 3	Route RS232 commands from rear UART to HDBT receiver 3
RS232 bypass	#uart0 bypass=0	Uart DB9 bypass to DB9	Route RS232 commands from rear UART to internal

2. Audio Control

Function	Command Example	Response	Description
Audio input state query	#audio_d in0 enc=help	<in1 audio embedded> Data:HDMI. <in2 audio embedded> Data:Mute. <in3 audio embedded> Data:HDMI. <in4 audio embedded> Data:HDMI. <in5 audio embedded> Data:HDMI. <in6 audio embedded> Data:Analog. <in7 audio embedded> Data:HDMI. <in8 audio embedded> Data:HDMI.	Audio status of each HDMI input Range HDMI, Analogue, Mute
Mute audio input	#audio_d in2 enc=0	<in2 audio embedded> Data:Mute.	Mute audio for input 2 (0 for all)
Select HDMI audio input	#audio_d in2 enc=1	<in2 audio embedded> Data:HDMI.	Select HDMI audio for input 2 (0 for all)
Select analogue audio input	#audio_d in2 enc=2	<in2 audio embedded> Data:Analog.	Select analogue audio for input 2 (0 for all) to be embedded into HDMI
Audio input lock state query	#audio_l in0 enc=help	<in1 audio embedded> Lock:0. <in2 audio embedded> Lock:1. <in3 audio embedded> Lock:0. <in4 audio embedded> Lock:0. <in5 audio embedded> Lock:0. <in6 audio embedded> Lock:0. <in7 audio embedded> Lock:0. <in8 audio embedded> Lock:0.	Lock status of each audio input. Range is 0-1, 0 being unlocked
Lock audio input	#audio_l in2 enc=1	<in2 audio embedded> Lock:1.	Lock input 2 embedded audio

<p>Audio output lock state query</p>	<p>#audio_l out0 enc=help</p>	<p><out1 audio hdmi> Lock:0.</p> <p><out1 audio de-embedded iis> Lock:0.</p> <p><out1 audio de-embedded spdif> Lock:0.</p> <p><out2 audio hdmi> Lock:0.</p> <p><out2 audio de-embedded iis> Lock:0.</p> <p><out2 audio de-embedded spdif> Lock:0.</p> <p><out3 audio hdmi> Lock:0.</p> <p><out3 audio de-embedded iis> Lock:0.</p> <p><out3 audio de-embedded spdif> Lock:0.</p> <p><out4 audio hdmi> Lock:0.</p> <p><out4 audio de-embedded iis> Lock:0.</p> <p><out4 audio de-embedded spdif> Lock:0.</p> <p><out5 audio hdmi> Lock:0.</p> <p><out5 audio de-embedded iis> Lock:0.</p> <p><out5 audio de-embedded spdif> Lock:0.</p> <p><out6 audio hdmi> Lock:0.</p> <p><out6 audio de-embedded iis> Lock:0.</p> <p><out6 audio de-embedded spdif> Lock:0.</p> <p><out7 audio hdmi> Lock:0.</p> <p><out7 audio de-embedded iis> Lock:0.</p>	<p>Lock status of each audio input. Range is 0-1, 0 being unlocked</p>
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		<out7 audio de-embedded spdif> Lock:0. <out8 audio hdmi> Lock:0. <out8 audio de-embedded iis> Lock:0. <out8 audio de-embedded spdif> Lock:0.	
Lock HDMI audio output	#audio_l out2 enc=1	<in2 audio embedded> Lock:1.	Lock output 2 HDMI audio
Lock analogue audio output	#audio_l out4 iis=1	<out4 audio de-embedded iis> Lock:1.	Lock output 4 analogue audio
Lock SPDIF audio output	#audio_l out4 spdif=1	<out4 audio de-embedded spdif> Lock:1.	Lock output 4 SPDIF audio

3. EDID Management – read EDID from outputs and/or to inputs. EDID read from source or displays will appear in centre of reply <EDID Start/.../EDID End>

Function	Command Example	Response	Description
Query current EDID info	#edid_d in0 mode=help	<in1 EDID mode> Data:Default. <in1 EDID data> Data:1. <in2 EDID mode> Data:Default. <in2 EDID data> Data:1. <in3 EDID mode> Data:Default. <in3 EDID data> Data:1. <in4 EDID mode> Data:Default. <in4 EDID data> Data:1. <in5 EDID mode> Data:Default. <in5 EDID data> Data:1. <in6 EDID mode> Data:Default. <in6 EDID data> Data:1. <in7 EDID mode> Data:Default. <in7 EDID data> Data:1. <in8 EDID mode> Data:Default. <in8 EDID data> Data:1	Obtain the current EDID settings for all inputs Mode is the source of the EDID 0=Default 1=User mode 2=Copy HDMI 3=Copy HDBaseT Data defines the default type or output channel number when copying from a display
Copy EDID value from HDMI output	#edid_d in0 mode=2 data=1	<in1 EDID mode> Data:Copy HDMI. <in2 EDID mode> Data:Copy HDMI. <in3 EDID mode> Data:Copy HDMI. <in4 EDID mode> Data:Copy HDMI. <in5 EDID mode> Data:Copy HDMI.	Copy EDID data of screen or device attached to HDMI output 1 port to all inputs

		<p><in6 EDID mode> Data:Copy HDMI.</p> <p><in7 EDID mode> Data:Copy HDMI.</p> <p><in8 EDID mode> Data:Copy HDMI.</p>	
Copy EDID value from HDBaseT output	#edid_d in0 mode=3 data=4	<p><in3 EDID mode> Data:Copy HDBT.</p> <p><in3 EDID data> Data:4.</p> <p><in4 EDID mode> Data:Copy HDBT.</p> <p><in4 EDID data> Data:4.</p> <p><in5 EDID mode> Data:Copy HDBT.</p> <p><in5 EDID data> Data:4.</p> <p><in6 EDID mode> Data:Copy HDBT.</p> <p><in6 EDID data> Data:4.</p> <p><in7 EDID mode> Data:Copy HDBT.</p> <p><in7 EDID data> Data:4.</p> <p><in8 EDID mode> Data:Copy HDBT.</p> <p><in8 EDID data> Data:4.</p>	Copy EDID data of screen or device attached to HDBaseT (mode=3) output 4 port (data=4) to all inputs (in0)
Use default EDID values	#edid_d in0 mode=0 data=8	<p><in1 EDID mode> Data:Default.</p> <p><in1 EDID data> Data:8.</p> <p><in2 EDID mode> Data:Default.</p> <p><in2 EDID data> Data:8.</p> <p><in3 EDID mode> Data:Default.</p> <p><in3 EDID data> Data:8.</p> <p><in4 EDID mode> Data:Default.</p> <p><in4 EDID data> Data:8.</p>	Use EDID default data stored in the matrix (mode=0) output 8 port (data=4) to all inputs (in0)

		<in5 EDID mode> Data:Default. <in5 EDID data> Data:8. <in6 EDID mode> Data:Default. <in6 EDID data> Data:8. <in7 EDID mode> Data:Default. <in7 EDID data> Data:8. <in8 EDID mode> Data:Default. <in8 EDID data> Data:8.																	
<table border="1"> <tr> <td>Default 1</td> <td>4K60 444 HDR AC-35.1</td> <td>Default 5</td> <td>4K30 444 3D LPCM2.0</td> </tr> <tr> <td>Default 2</td> <td>4K60 444 HDR LPCM7.1</td> <td>Default 6</td> <td>4K60 420 HDR 3D AC-35.1</td> </tr> <tr> <td>Default 3</td> <td>4K60 444 HDR LPCM2.0</td> <td>Default 7</td> <td>4K60 420 3D LPCM2.0</td> </tr> <tr> <td>Default 4</td> <td>4K60 444 LPCM2.0</td> <td>Default 8</td> <td>1080P60 444 3D LPCM2.0</td> </tr> </table>				Default 1	4K60 444 HDR AC-35.1	Default 5	4K30 444 3D LPCM2.0	Default 2	4K60 444 HDR LPCM7.1	Default 6	4K60 420 HDR 3D AC-35.1	Default 3	4K60 444 HDR LPCM2.0	Default 7	4K60 420 3D LPCM2.0	Default 4	4K60 444 LPCM2.0	Default 8	1080P60 444 3D LPCM2.0
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Default 4	4K60 444 LPCM2.0	Default 8	1080P60 444 3D LPCM2.0																
EDID input lock state query	#edid_l in0 mode=help	<in3 EDID data> Lock:0. <in4 EDID mode> Lock:0. <in4 EDID data> Lock:0. <in5 EDID mode> Lock:0. <in5 EDID data> Lock:0. <in6 EDID mode> Lock:0. <in6 EDID data> Lock:0. <in7 EDID mode> Lock:0. <in7 EDID data> Lock:0. <in8 EDID mode> Lock:0. <in8 EDID data> Lock:0.	Lock status of each EDID input. Range is 0-1, 0 being unlocked																
Lock EDID input	#edid_l in5 mode=1	<in5 EDID mode> Lock:1.	Lock input 5 EDID																

4. Crosspoint Control

Function	Command Example	Response	Description
Obtain current video crosspoint info	#video_d out0 matrix=help	<out1 video onoff> Data:On. <out1 video matrix> Data:1. <out2 video onoff> Data:On. <out2 video matrix> Data:1. <out3 video onoff> Data:On. <out3 video matrix> Data:1. <out4 video onoff> Data:On. <out4 video matrix> Data:4. <out5 video onoff> Data:On. <out5 video matrix> Data:5. <out6 video onoff> Data:On. <out6 video matrix> Data:6. <out7 video onoff> Data:On. <out7 video matrix> Data:7. <out8 video onoff> Data:On. <out8 video matrix> Data:8.	Obtain the current info for video crosspoint settings and output working states.
Obtain video input status	#video_d in0 matrix=help	<in1 video onoff> Data:On.	Obtain input working states.

		<in2 video onoff> Data:On. <in3 video onoff> Data:On. <in4 video onoff> Data:On. <in5 video onoff> Data:On. <in6 video onoff> Data:On. <in7 video onoff> Data:On. <in8 video onoff> Data:On.	
Set individual video crosspoint	#video_d out7 matrix=3	<out7 video matrix> Data:3.	Set video crosspoint input 3 to output 7
Set all video crosspoints	#video_d out0 matrix=7	<out1 video matrix> Data:7. <out2 video matrix> Data:7. <out3 video matrix> Data:7. <out4 video matrix> Data:7. <out5 video matrix> Data:7. <out6 video matrix> Data:7. <out7 video matrix> Data:7. <out8 video matrix> Data:7.	Set video crosspoint input 7 to all outputs
Disable video input	#video_d in1 onoff=0	<in1 video onoff> Data:Off.	Disable video input 1
Enable video input	#video_d in1 onoff=1	<in1 video onoff> Data:On.	Disable video input 1

Disable video output	#video_d out2 onoff=0	<out2 video onoff> Data:Off.	Disable video output 2, impacts both HDMI and HDBaseT outputs
Enable video output	#video_d out2 onoff=1	<out2 video onoff> Data:On.	Enable video output 2, impacts both HDMI and HDBaseT outputs
Obtain video output settings	#video_l out0 matrix=help	<out1 video onoff> Lock:0. <out1 video matrix> Lock:0. <out2 video onoff> Lock:0. <out2 video matrix> Lock:0. <out3 video onoff> Lock:0. <out3 video matrix> Lock:0. <out4 video onoff> Lock:0. <out4 video matrix> Lock:0. <out5 video onoff> Lock:0. <out5 video matrix> Lock:0. <out6 video onoff> Lock:0. <out6 video matrix> Lock:0. <out7 video onoff> Lock:0. <out7 video matrix> Lock:0. <out8 video onoff> Lock:0. <out8 video matrix> Lock:0.	Lock current settings for all video outputs

Lock video output settings	#video_l out0 matrix=1	<out1 video matrix> Lock:1. <out2 video matrix> Lock:1. <out3 video matrix> Lock:1. <out4 video matrix> Lock:1. <out5 video matrix> Lock:1. <out6 video matrix> Lock:1. <out7 video matrix> Lock:1. <out8 video matrix> Lock:1.	Lock all video outputs
Unlock video output settings	#video_l out0 matrix=0	<out1 video matrix> Lock:0. <out2 video matrix> Lock:0. <out3 video matrix> Lock:0. <out4 video matrix> Lock:0. <out5 video matrix> Lock:0. <out6 video matrix> Lock:0. <out7 video matrix> Lock:0. <out8 video matrix> Lock:0.	Unlock all video outputs

5. IP Port Configuration

Function	Command Example	Response	Description
Query current IP settings	#ip help	#DHCP : off #IP : 192.168.1 .168 #MASK : 255.255.255.0 #GW : 192.168.1 .1 #DNS : 144.144.144.144 #MAC : 00:08:DC:E0:D4:2C #Netbios : WEB	Obtain the current ip address, gateway, subnet mask and DNS
Change ip settings	#ip ip=192.168.1.88 mask=255.255.255.0 gw=192.168.1.1 dns=144.144.144.144	IP : 192.168. 1. 88. GW : 192.168. 1. 1. MASK: 255.255.255. 0. DNS : 144.144.144.144.	Change the IP settings. And field can have the value in a range of 0-255