

BLACKBIRD™



4K 4x4 HDMI® Matrix

PN 15749 < RS-232 GUIDE



INTRODUCTION

This Blackbird™ device can be controlled by a computer using an RS-232 serial connection and by issuing commands using RS-232 control software.

CONNECTION

This device includes a DB-9 male to female RS-232 serial cable, which is used to connect your PC to the matrix. If your PC lacks a DB-9 serial port, you will need to use a USB to Serial adapter cable (available separately P/N 3726).

RS-232 GUI CONTROL

This device includes software, which allows you to directly control it using either an Ethernet or RS-232 connection. Simply copy **4x4 HDMI matrix Controller.exe** to your PC and double-click the file to launch it.

General Screen

The screenshot shows the '4x4 HDMI Matrix Controller' application window. The 'General' tab is active. The interface is divided into several sections:

- Control Mode Select:** Features two radio buttons. 'COM Control Mode' is selected and highlighted with a circled '1'. 'TCP Control Mode' is unselected.
- COM:** Includes a 'Port' dropdown menu set to 'COM1', highlighted with a circled '2'. A 'Connect' button is located to the right.
- TCP Control Mode:** Includes a 'Switcher IP' dropdown menu, highlighted with a circled '3'. Below it are 'Search' and 'Config...' buttons. A 'Connect' button is also present.
- Device Information:** A large rectangular area on the right, highlighted with a circled '4'. It contains 'Status' and 'Clear' buttons at the bottom.
- Reset to the factory settings:** Includes a 'Factory Reset' button, highlighted with a circled '5'.
- Disable/Enable Beep:** Includes a checkbox labeled 'Enable Beep', highlighted with a circled '6'.



Perform the following steps to connect your PC to the converter.

1. Click the radio button to the left of **COM control mode** (1).
2. Use the pull-down list box to select the **COM Port** used (2).
3. Click the **Connect** button (2) to make the connection.
4. Click the **Status** button to display **Device Information** (4).

EDID Screen

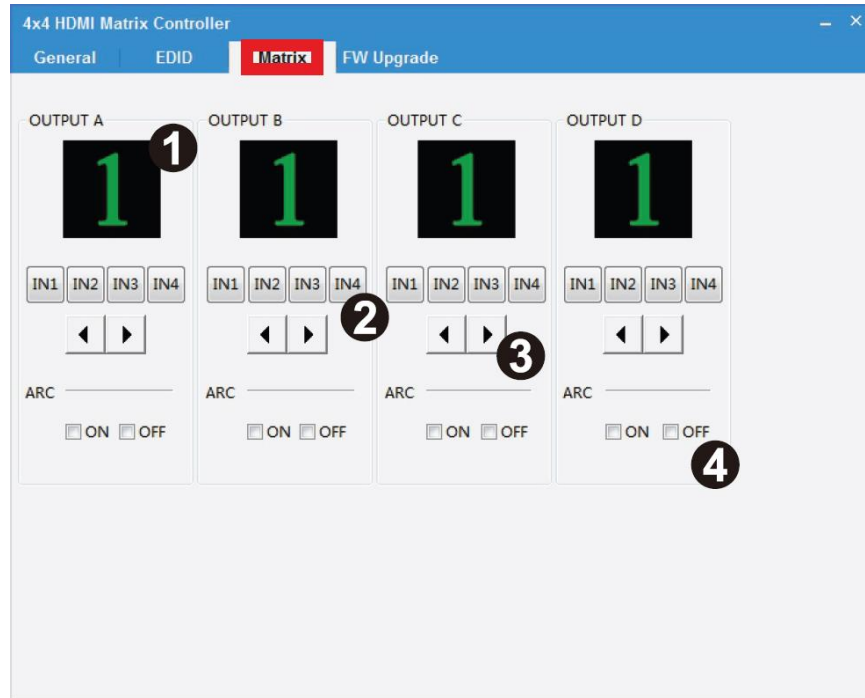
The screenshot shows the '4x4 HDMI Matrix Controller' software window. The 'EDID' tab is selected. The 'Manual Mode' section contains three rows of controls: 'Set EDID Mode' with a dropdown set to '1080p,Stereo Audio 2.C' and a 'Set' button (callout 1); 'Copy EDID From' with a dropdown set to 'HDMI OUTA' and a 'Set' button (callout 2); and 'Open EDID' with a file browser icon, an empty text field, and a 'Set' button (callout 3). The 'Input EDID List' section shows a table with four rows: 'IN1: Default EDID', 'IN2: Default EDID', 'IN3: Default EDID', and 'IN4: Default EDID'. A 'Status' button is at the bottom of this section (callout 4).

Input	EDID
IN1:	Default EDID
IN2:	Default EDID
IN3:	Default EDID
IN4:	Default EDID

The EDID screen allows you to directly set a specific EDID® set from the built-in EDID table, copy the EDID from a device connected to one of the outputs, or load EDID from a file on your PC.



Matrix Screen



The **Matrix** screen allows you to set the connections for each output.

- Click one of the **IN#** buttons (2) to directly select that input.
- Use the ◀ and ▶ buttons (3) to cycle backwards or forwards to the next available input in either direction.

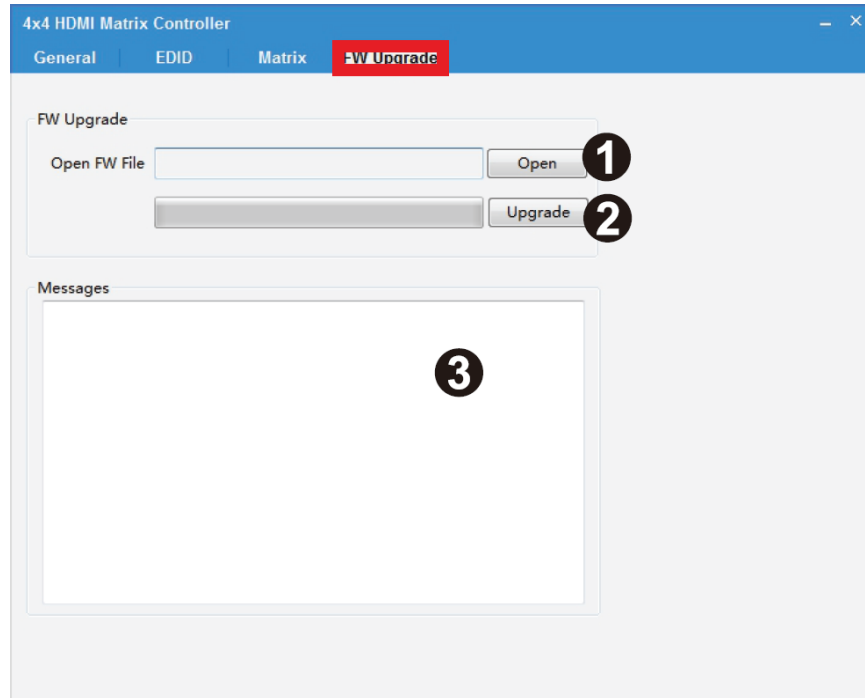
You can also enable or disable the Audio Return Channel (ARC) feature for each output.

Notes:

- In order to use ARC, your TV must support ARC and you must use an HDMI® cable that also supports ARC.
- When ARC is enabled, the Coaxial output will carry the audio signal from the TV. Otherwise, the Coaxial output carries audio from the HDMI source device.



FW Upgrade Screen



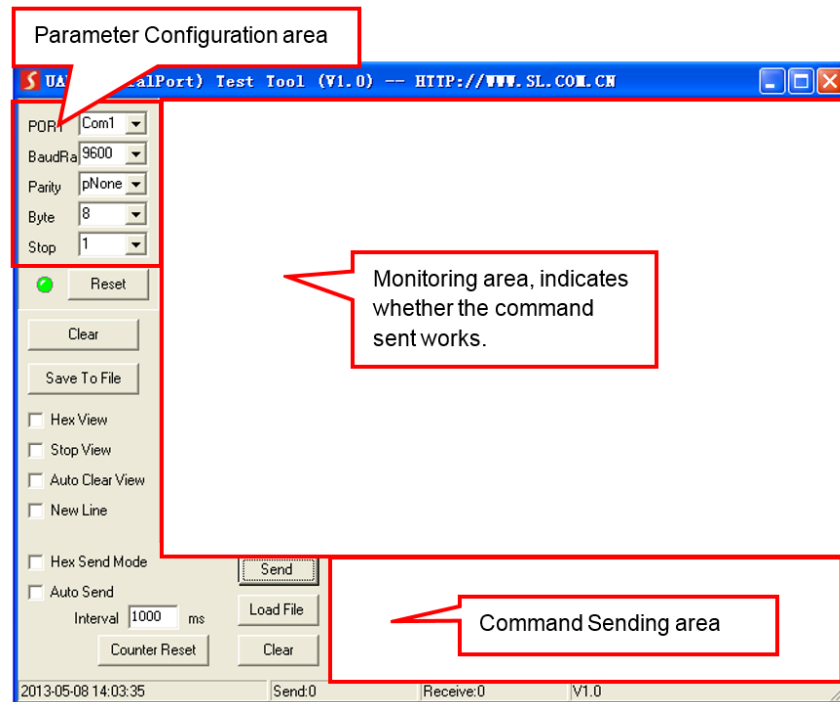
In the event that updated firmware software is available, you can apply it on the **FW Upgrade** screen. Perform the following steps to upgrade your firmware.

1. Open your web browser and type **www.monoprice.com** into the address bar.
2. Enter **15749** in the search bar on the Monoprice™ website to get to the product page.
3. Scroll to the bottom of the page and locate the **Support Files** section. Download the updated firmware zip file.
4. Extract the firmware file from the zip file.
5. Click the **Open** button (1) to open the file browser. Locate and select the firmware file. The file path is displayed in area to the left of the **Open** button.
6. Click the **Upgrade** button (2). The upgrade progress is displayed in the area to the left of the button.



SOFTWARE

Rather than GUI control, you can also issue direct commands using a third party RS-232 control software package, such as **CommWatch.exe**, whose interface is depicted below.



Set the communications parameters to the following:

Baud Rate: 115200

Data Bits: 8

Stop Bits: 2

Parity Bits: None



RS-232 COMMANDS

The following commands are in hex, not ascii, so you should select the **Hex Send Mode** option in your command software before issuing commands. Note that each command is 13 bytes long.

Checksum

Many of the following commands require that a checksum be included as part of the command. This ensures that command is input correctly. The checksums must be calculated in hex mode. We suggest you use a calculator with a hex mode option. Calculate the checksum using the following formula:

$$\text{Checksum} = 0x100 - (0xa5 + 0x5b + 0x02 + 0x03 + \text{input port} + 0x00 + \text{output port} + 0x00 + 0x00 + 0x00 + 0x00 + 0x00)$$

Port Switching

Issue the following command to switch the input for a given output.

$$0xa5 + 0x5b + 0x02 + 0x03 + \text{input port}(1\sim4) + 0x00 + \text{output port}(1\sim4) + 0x00 + 0x00 + 0x00 + 0x00 + 0x00 + \text{checksum}$$

For example, to set Output 2 to Input 1, issue the following command:

A5 5B 02 03 02 00 01 00 00 00 00 00 F8

Port Query

Issue the following command to display which input is selected for a given output.

Send Package: A5 5B 02 01 **01** 00 00 00 00 00 00 00 FC

Receive Package: A5 5B 02 01 01 00 **01** 00 00 00 00 00 FB

The red **01** in the Send Package is the output port number. Replace it with a 02, 03, or 04 if you want to query a different output port.



The blue **01** in the Receive Package is the input port number. It will be 02, 03, or 04 if a different input port is connected.

ARC Set

The following command allows you to enable or disable ARC for a given output.

0xa5+0x5b+0x10+0x01+ARC (0x0f:ON;0xf0:OFF)+0x00+input
port(1~4)+0x00+0x00+0x00+0x00+0x00+checksum

ARC Query

Issue the following command to display the ARC status for a given output.

Send Package: A5 5B 10 02 00 00 input port(1~4)00 00 00 00 00 checksum

Receive Package: A5 5B 10 02 **F0** 00 input port(1~4) 00 00 00 00 00 checksum

The blue **F0** indicates that ARC is off. It will be **0F** if ARC is on.

EDID Set

The following command allows you to specify which EDID® to use from the internal EDID table for one or all inputs.

0xa5+0x5b+0x03+0x02+Edid index(1~15)+0x00+input
port(0~4)+0x00+0x00+0x00+0x00+0x00+checksum

Note that using 00 for the input port indicates all inputs.

Index	EDID	Index	EDID
1	1080p,Stereo Audio 2.0	9	3D,HD Audio 7.1
2	1080p,Dolby®/DTS® 5.1	10	4K2K30,Stereo Audio 2.0
3	1080p,HD Audio 7.1	11	4K2K30,Dolby/DTS 5.1
4	1080i,Stereo Audio 2.0	12	4K2K30,HD Audio 7.1
5	1080i,Dolby/DTS 5.1	13	4K2K60,Stereo Audio 2.0



6	1080i,HD Audio 7.1	14	4K2K60,Dolby®/DTS® 5.1
7	3D,Stereo Audio 2.0	15	4K2K60,HD Audio 7.1
8	3D,Dolby/DTS 5.1		

EDID Copy

The following command allows you to copy the EDID® settings from a device connected to one of the outputs to one or all inputs.

```
0xa5+0x5b+0x03+0x04+output port (1~4)+0x00+input
port(0~4)+0x00+0x00+0x00+0x00+0x00+checksum
```

Note that using 00 for the input port indicates all inputs.

EDID Query

Issue the following command to display the EDID Index.

```
Send Package:      A5 5B 01 0C 01 00 00 00 00 00 00 00 checksum
```

```
Receive Package:   A5 5B 01 0C 01 00 01 00 00 00 00 00 checksum
```

The red **01** in the send package is the input port (01~04). The blue **01** in the receive package is the EDID Index number.

Output Hot Plug Detect Status

Issue the following command to display the Hot Plug Detect (HPD) status of one of the outputs.

```
Send Package:      A5 5B 01 05 01 00 00 00 00 00 00 00 F9
```

```
Receive Package:   A5 5B 01 05 01 00 FF 00 00 00 00 00 FA
```

The red **01** in the Send Package is the output port number. Replace it with a 02, 03, or 04 if you want to query a different output port.



The blue **FF** in the Receive Package indicates that HPD is Low. It will change to **00** if the HPD status is High.

Input Port Status

Issue the following command to display whether an input is connected.

Send Package: A5 5B 01 04 **01** 00 00 00 00 00 00 00 FA

Receive Package: A5 5B 01 04 01 00 **FF** 00 00 00 00 00 FB

The red **01** in the Send Package is the input port number. Replace it with a 02, 03, or 04 if you want to query a different output port.

The blue **FF** in the Receive Package indicates that there is no cable connection. It will change to **00** if there is a cable connection.

Beep On/Off

The following command allows you to turn on or off the beep that sounds when a front panel button is pressed.

0xa5+0x5b+0x06+0x01+Beep onoff(0x0f:ON;
0xf0:OFF)+0x00+0x00+0x00+0x00+0x00+0x00+0x00+checksum

Beep Status

Issue the following command to display the status of the beep that sounds when a front panel button is pressed.

Send Package: A5 5B 01 0B 00 00 00 00 00 00 00 00 F4

Receive Package: A5 5B 01 0B 00 00 **FF** 00 00 00 00 00 F5

The blue **FF** indicates that the beep is off. It will change to **00** if the beep is on.



Monoprice™, Blackbird™, the Blackbird logo, and all Monoprice logos are trademarks of Monoprice Inc.

HDMI®, the HDMI Logo, and High-Definition Multimedia Interface are trademarks or registered trademarks of HDMI Licensing LLC in the United States and other countries.

EDID® is a registered trademark of the Video Electronics Standards Association.

Dolby®, Dolby Audio™, and the double-D symbol are trademarks of Dolby Laboratories.

DTS®, the Symbol, and DTS and the Symbol together are registered trademarks of DTS, Inc.





TECHNOLOGY AT PRICES THAT MAKE SENSE

Need Help? We're here for you!
Contact us www.monoprice.com/contactus

Product pictures are for reference only.
Specifications described herein are subject to change without prior notification.
All trademarks are the sole property of their respective companies.
Blackbird™ is a Sub-brand of Monoprice Inc.

Copyright © 2021 Monoprice, Inc. All rights reserved.

www.monoprice.com

