



# User Manual

## **SY-HDS41A-18G**

### **4K 18G HDMI 2.0 4x1 Switcher with ARC**

4 Input HDMI Switcher  
with  
De-Embedded Audio and ARC support

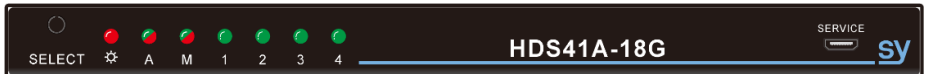
The SY-HDS41A-18G is a four-input, single-output HDMI 2.0 video switcher with both manual and auto selection modes. This switcher is useful for switching up to four HDMI sources to a single display device. The switcher can be controlled manually from the front panel, the RS232 interface, or the IR remote controller (included).

## Features

- Supports all HDMI resolutions up to 4K@60 4:4:4 HDR
- 18G high bandwidth
- 4x HDMI video inputs, 1x HDMI output
- HDMI Input 4 supports ARC
- Video switching from Front Panel, RS232 control, or IR
- Auto input selection
- HDMI 2.0 compatible
- Supports 4K@60, full 3D, HDCP1.4/2.2 and CEC

## Connectors and Controls

### Front



Name	Description
<b>SELECT</b>	For manual selection of the desired input, or toggling between the Auto/Manual switching modes
<b>Power LED</b>	Unit is powered when this LED is lit
<b>A</b>	Audio Status – Green for de-embedded HDMI or Yellow for ARC mode
<b>M</b>	Selection Mode – Green for Manual-switching mode or Yellow for Auto-switching mode
<b>Input LEDs (1-4)</b>	Indicates the selected input
<b>SERVICE</b>	Firmware update input

### Rear



Name	Description
<b>INPUTS (HD1-HD4)</b>	HDMI inputs from up to 4 HDMI sources. HD4 has ARC function
<b>OUT</b>	HDMI output to the HDMI display device
<b>AUDIO</b>	Stereo audio output (3.5mm Stereo Jack)
<b>RS232</b>	RS232 control input (Tip = Tx, Ring = Rx, Sleeve = GND)
<b>IR IN</b>	Input for IR detector
<b>EDID Switch</b>	See <b>EDID Management</b> below
<b>5V DC</b>	5V DC power input

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## Using the HDMI Video Switcher

Connect up to 4 HDMI video sources to the HDMI INPUT connectors with a HDMI cable from the HDMI source device to the HDMI input of the SY-HDS41A-18G. Connect a HDMI cable from the HDMI output of the SY-HDS41A-18G to the HDMI display device.

Whenever the SY-HDS41A-18G is powered up, it will restart in the state before being switched off.

### Manual Selection Mode

To use Manual selection mode the M (Mode) LED must be green.

Press and hold Select button for 3 seconds to set the M LED to green before making manual selections.

Briefly press the SELECT button until the desired input is displayed. The numbered LEDs on the front panel indicate the selected input.

### Auto Selection Mode

The SY-HDS41A-18G has an automatic input selection mode, note that this not an auto sequence mode.

The auto selection mode ensures that there will always be an image shown on the HDMI display device provided that there is at least one functioning HDMI input signal.

To enable the auto selection mode, press and hold the SELECT button for 3 seconds until the M LED (Mode) changes to yellow. In this mode the SY-HDS41A-18G behaves in the following manner:

1. **New input:** When a new HDMI signal is detected, that input is automatically selected.
2. **Source removed:** When currently selected source is removed, it will automatically select the next available input (starting at input 1).
3. **Front Panel Select:** Only available inputs can be selected.

### ARC Mode - Audio Mode LED

The Audio LED indicates the status of the current audio mode:

**Green:** Embedded HDMI audio mode – This is default mode or after `>>AUDInternal RS232` command.

**Amber:** ARC audio output is enabled – This is set after sending the `>>AUDExternal RS232` command.

To use the ARC audio, an ARC amplifier or soundbar should be connected to HDMI input 4. In this way the ARC stream will pass to the active HDMI (ARC enabled) source.

### IR Remote Control

The SY-HDS41A-18G is supplied with a remote control key pad that allows the operator to change the input selection provided that there is a direct line of sight to the switcher unit. Simply plug in the IR detector to the rear of the SY-HDS41A-18G and then make your selection from the IR remote key pad. (Battery: CR2025, not supplied).

# EDID Management

The SY-HDS41A-18G can handle EDID data by any one of three methods:

1. Copy the EDID from the output automatically to all inputs – Pass Through mode.
2. Use one of the ten embedded EDID as per table (15 EDID; however 11-15 can be customised).
3. Customise & use one of five custom EDID (11-15), each of which can be upgraded separately.

Simply set the EDID DIP switch to the desired setting as per following table:

Setting 1 2 3 4	ID	EDID Mode
UUUU	0	EDID Pass-Through ; Copy display EDID to all inputs
UUUD	1	1080p 60Hz / 2ch Audio ; (1920x1080 @ 60Hz, 2ch PCM)
UUUU	2	1080p 60Hz 10-bit colour / 2ch Audio
UUDD	3	1920x1200 60Hz / 2ch Audio
UUUU	4	4K24 HDR / 2ch Audio ; (3840x2160p @ 24Hz HDR-10, 2ch PCM)
UUUD	5	4K60 / 2ch Audio ; (3840x2160p @ 60Hz, 2ch PCM)
UUUU	6	4K60 / 5.1ch Audio ; (3840x2160p @ 60Hz, 6ch PCM)
UUDD	7	4K60 / 7.1ch Audio ; (3840x2160p @ 60Hz, 8ch PCM)
DUUU	8	4K60 HDR / 2ch Audio ; (3840x2160p @ 60Hz HDR-10, 2ch PCM)
DUUD	9	4K60 HDR / 5.1ch Audio ; (3840x2160p @ 60Hz HDR-10, 6ch PCM)
DUUU	10	4K60 HDR / 7.1ch Audio ; (3840x2160p @ 60Hz HDR-10, 8ch PCM)
DUDD	11	Custom EDID 1 – (factory: 1080p 60 / 5.1ch Audio)
DDUU	12	Custom EDID 2 – (factory: 1366x768 60Hz / 2ch Audio)
DDUD	13	Custom EDID 3 – (factory: 4K60 10-bit colour / 2ch Audio)
DDUU	14	Custom EDID 4 – (factory: 4K60 10-bit colour / 2ch Audio)
DDDD	15	Custom EDID 5 – (factory: 4K60 10-bit colour / 7.1 Audio)

**Table 1 - EDID Switch Settings**

In the above table **D** means the switch is in the **DOWN** (ON) state and **U** means it is in the **UP** (OFF) state.

The default factory EDID settings in the Custom EDID memories (11-15) will be lost when any of these five locations are programmed with new EDID data.

Each of the five Custom EDID locations can be programmed individually with any valid EDID data using the following procedure:

1. Set a binary EDID image file with a filename using the following rules:
  - a. The filename must follow this format: **EC\_ss\_vvvv\_aaa.bin**
    - i. **ss** is the Custom EDID ID value in the range 11 to 15 (see Table 1 above)
    - ii. **vvvv** represents the video parameter (for example: 1080p).
    - iii. **aaa** represents the audio parameter (for example: 2ch).
2. Power up the SY-HDS41A-18G and connect the SERVICE USB port to a PC. The PC will then open a file explorer window with the name BOOTDISK that contains the file READY.TXT.
3. Copy the above EDID file to the BOOTDISK window - BOOTDISK window will then close automatically.

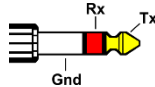
4. If the BOOTDISK window does not reopen again, open the BOOTDISK drive folder.
5. The folder will have a file named SUCCESS.TXT when the EDID copy was successful.
6. Refresh the BOOTDISK folder and repeat from step 3, to program any further EDID locations.
7. Once the Custom EDID locations have been programmed, disconnect the SY-HDS41A-18G from the PC.
8. Select the desired Custom EDID location by setting the EDID switches on the rear of the SY-HDS41A-18G as given in Table 1.

## RS232 Commands

### SY-HDS41A-18G Control

The following RS232 commands provide control of the SY-HDS41A-18G from a PC, laptop or programmable control panel. The RS232 settings are: 9600 baud, 8 bits, no parity, and 1 stop bit.

The RS232 connections to the 3.5 mm stereo jack connector are:



All commands to the SY-HDS41A-18G must be terminated with a carriage return character, 0x0d.

All replies for the SY-HDS41A-18G are always terminated with both the carriage return and line feed characters, 0x0d 0x0a.

Action	Command	Response
Select input 1	>>HDMI1	<<HDMI1
Select input 2	>>HDMI2	<<HDMI2
Select input 3	>>HDMI3	<<HDMI3
Select input 4	>>HDMI4	<<HDMI4
Enable Auto Mode	>>AUTO	<<Auto Switch
Enable Manual Mode <sup>(note 1)</sup>	>>MANUAL	<<Manual Switch
Set the ARC mode on	>>AUDExternal	<<AUDExternal
Set the ARC mode off	>>AUDInternal	<<AUDInternal
Get system Status	>>SYSInfo	<b>See Note 2</b>
System Reset	>>RESET	

Notes:

1. Auto mode is always disabled whenever a manual selection command is transmitted.
2. The actual response provides the current operating status of the unit giving the switching status, switching mode and the ARC status. For example:

```
<<SY-HDS41A-18G
<<V1.0.0
<<-----
<<HDMI1
<<Auto switch
<<AUDInternal
<<EDID0
```

## CEC Device Control

The SY-HDS41A-18G also provides control of any CEC enabled devices connected to HDMI inputs 1 to 3 only. Only the currently selected input (except HDMI4) will output the CEC commands. Each of the commands given in the following tables are sent to the RS232 port, The SY-HDS41A-18G will output the appropriate CEC messages, when an RS232 command from below tables is received.

### Source and Playback Device Control

CEC Operation	RS232 Command	Response
Turn the input source on	>>SRCon	<<SRCon
Turn the input source off	>>SRCOff	<<SRCOff
Play	>>SRCPlay	<<SRCPlay
Pause	>>SRCPause	<<SRCPause
Stop	>>SRCStop	<<SRCStop
Fast Forward	>>SRCForward	<<SRCForward
Fast Rewind	>>SRCBackward	<<SRCBackward
Next Section	>>SRCSkipForward	<<SRCSkipForward
Previous Section	>>SRCSkipBackward	<<SRCSkipBackward
Open menu	>>SRCMenu	<<SRCMenu
Go Back	>>SRCBack	<<SRCBack
Conform (OK)	>>SRCOK	<<SRCOK
Exit	>>SRCExit	<<SRCExit
Navigate Up	>>SRCUp	<<SRCUp
Navigate Down	>>SRCDown	<<SRCDown
Navigate Left	>>SRCLeft	<<SRCLeft
Navigate Right	>>SRCRight	<<SRCRight

### Display Device Control

CEC Operation	RS232 Command	Response
Turn the display device on	>>TVOn	<<TVOn
Turn the display device off	>>TVOff	<<TVOff
Display volume up	>>TVVOL+	<<TVVOL+
Display volume down	>>TVVOL-	<<TVVOL-
Display volume mute	>>TVMUTE	<<TVMUTE
Display volume unmute	>>TVUNMUTE	<<TVUNMUTE

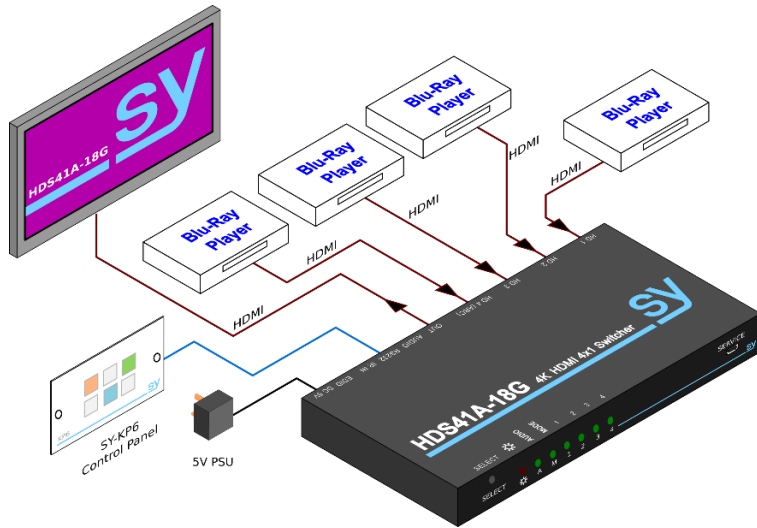


Figure 1 – SY-HDS41A-18G Connection Diagram

## Specifications

### Video

<b>HDMI Resolutions</b>	480i, 480p, 720i, 720p, 1080i, 1080p, 1920 x 1200, 4Kx2K@60Hz 4:4:4
<b>HDMI Standard</b>	HDMI 2.0
<b>3D Support</b>	Yes
<b>Deep Colour Support</b>	Yes
<b>HDR Support</b>	Yes
<b>Input HDCP Standards</b>	1.4 and 2.2
<b>Output HDCP Standards</b>	1.4 and 2.2

### Audio

<b>Analogue Output</b>	Stereo audio from 3.5mm stereo jack
<b>Format for De-embedding</b>	PCM 2ch only
<b>Output Impedance</b>	70R
<b>Frequency Response</b>	20Hz to 20kHz, ±3dB

### General

<b>RS232 Control</b>	9600, 8 data bits, 1 stop bit, no parity – No handshaking
<b>Power Supply</b>	5V DC
<b>Power Consumption</b>	5 W max
<b>Operating Condition</b>	0 - 40 °C - 10-90% RH, non-condensing
<b>Dimensions (W x H x D)</b>	194 x 15 x 81 mm
<b>Weight</b>	324 g

## Safety Instructions

To ensure reliable operation of these products as well as protecting the safety of any person using or handling these devices while powered, please observe the following instructions.

1. Use the power supplies provided. If an alternate supply is required, check Voltage, polarity and that it has sufficient power to supply the device it is connected to.
2. Do not operate either of these products outside the specified temperature and humidity range given in the above specifications.
3. Ensure there is adequate ventilation, as these products generate heat while operating.
4. Repair of the equipment should only be carried out by qualified professionals as these products contain sensitive devices that may be damaged by any mistreatment.
5. Only use these products in a dry environment. Do not allow any liquids or harmful chemicals to come into contact with these products.

## After Sales Service

1. Should you experience any problems while using these products, firstly refer to the Troubleshooting section in this manual before contacting SY Technical Support.
2. When calling SY Technical Support, the following information should be provided:
  - Product name and model number
  - Product serial number
  - Details of the fault and any conditions under which the fault occurs.
3. This product has a two year standard warranty, beginning from the date of purchase as stated on the sales invoice. Online registration of this product is required to activate the full three year extended warranty. For full details please refer to our Terms and Conditions.
4. SY Product warranty is automatically void under any of the following conditions:
  - The product is already outside of its warranty period
  - Damage to the product due to incorrect usage or storage
  - Damage caused by unauthorised repairs
  - Damage caused by mistreatment of the product
5. Please direct any questions or problems you may have to your local dealer before contacting SY Electronics.