KVM41-U3-18G

User Manual

4x1 HDMI 2.0 KVM switcher
4K2K @ 60Hz YCbCr 4:4:4
Keyboard/Mouse control, RS232 control
and
Automatic 4K → 2K Scaling

(With Keyboard & Mouse Hotkey)

Thank you for purchasing the SY-KVM41-U3-18G

The SY-KVM41-U3-18G is designed with the professional AV installers in mind. The many extensive features assist in system integration, validation and maintenance.

Installation precautions

This SY-KVM41-U3-18G has special circuitry to protect it against moderate surges and static discharges. However, to ensure reliable operation and long service life, it is important to take all necessary precautions against possible spikes, surges and static discharges.

Place the unit away from heat sources and allow adequate ventilation.

As much as possible cables should be routed away from any noisy sources and avoid long runs in close proximity to AC mains cables.

Contents

The KVM41-U3-18G is designed to allow USB-3.0, Keyboard, Video, and Mouse switching between up to four PCs. There are 6 USB ports for all peripherals such memory sticks, cameras, etc. Source switching can be from the keyboard, mouse, RS232, or the front panel.

A keyboard and mouse must be connected to the rear USB connectors to the SY-KVM41-U3-18G to use all its features.

Features

- Full 4K60 4:4:4 18Gbps HDMI supported
- Supports HDR and 12 bit deep colour
- HDCP 1.4 & 2.2 supported
- LPCM, Dolby Atmos, DTS-X
- Digital audio channels up to 7.1
- Analogue audio extraction
- 4x HDMI Inputs coupled with 4x USB 3.0 Type-B ports
- 2x USB 3.0 and 4x USB 2.0 Type A ports
- Hotkey switching, using Keyboard or Mouse
- EDID Management
- Test pattern generator
- Power-off memory
- Low power consumption (~6W)

Packing List

- SY-KVM41-U3-18G
- User Manual
- 12V DC power supply
- 1x Pair of mounting ears

Connectors and Controls

Front

Name	Description
SERVICE	For service personnel only.
Power LED	Lit when the product is powered up.
RS232	Serial port for RS232 control commands.
USB2.0	2x USB 2.0 Type A ports for USB peripheral devices.
USB3.0	2x USB 3.0 Type A ports for USB peripheral devices.
Line Out	De-embed Audio output.
INPUT Buttons 1~4	The selected button is lit green when the input video is displayed. An unconnected input is shown by a flashing green button.
INPUT USB Host LEDs	The blue LEDs beside the selection buttons light when the respective input USB port connected to a PC is active.

Rear
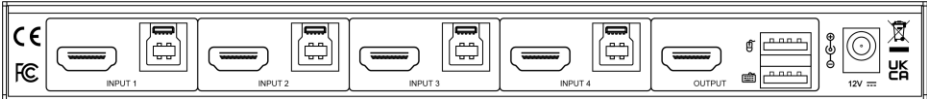
Name	Description
HDMI Inputs	Video signal from HDMI source or PC for inputs 1 to 4
USB3 Type B	USB Host Connection to respective PC for inputs 1 to 4
HDMI Output	Output to the display
USB2 Type A	2x USB-A 2.0 connectors for keyboard and mouse
12V DC	Input for 12V DC PSU

Using this Product

1. Connect the computer display outputs the HDMI inputs.
2. Connect USB Type A to Type B cable from the PC to the USB port on the KVM41-U3 for the respective input of all connected PCs.
3. Connect a display to the HDMI output.
4. Connect a keyboard and mouse to the USB ports on the rear of the KVM41-U3-18G.
5. Power up the sources, display and the KVM41-U3-18G.

Front Panel Control

Press one of the four input selection buttons to select that input. The button LED will flash briefly until the selection is completed.

When a valid HDMI signal is detected, the selected button will remain on (solid).

Any input that has no input signal will cause the selected button LED to continue flashing.

Keyboard Hot Key Control

The top of the KVM41-U3-18G, shown below, gives all the keyboard and mouse Hotkey combinations for selecting inputs as well as a few other functions. Each key is a separate press, the Ctrl key should not be kept pressed when entering Hotkey commands.

IMPORTANT: Hotkey commands will only function when the selected input has a PC/Laptop associated with it**.**
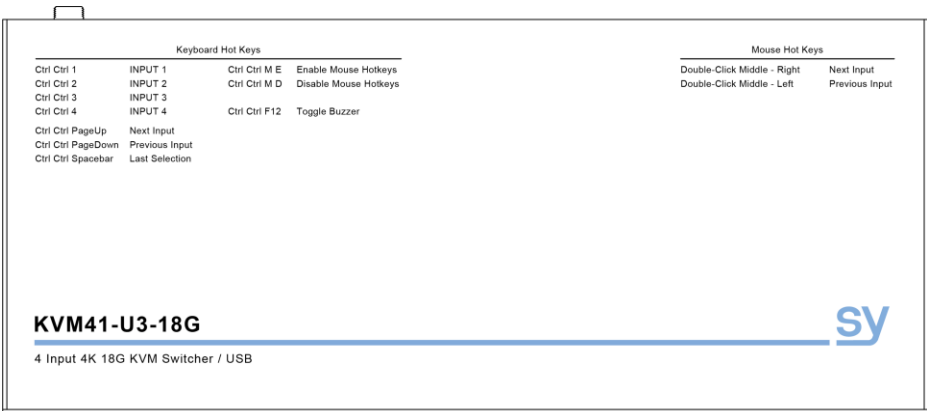
Ctrl Ctrl means to tap either the left or the right **Ctrl** button twice before tapping the final Hotkey command for the desired action. The double tap of the **Ctrl** can be replaced by a double tap on the **Scroll Lock** key also. The SY-KVM41-U3-18G will beep (if enabled), to signal acceptance of the double tap and waits for the next command key or keys as shown in the above image and listed below.

- *Ctrl Ctrl n*
  Direct input **n** (1-4) selection.

- *Ctrl Ctrl PageUp*
  Select the next higher input, with wrap around.

- *Ctrl Ctrl PageDown*
  Select the next lower input, with wrap around.

- *Ctrl Ctrl Spacebar*
  Toggle between the previous view and the current view.

- *Ctrl Ctrl M D*
  Disable the mouse hotkeys.

- *Ctrl Ctrl M E*
  Enable the mouse hotkeys.

- *Ctrl Ctrl F12*
  Toggle Buzzer (beep) mode. (on/off)

Mouse Hotkey Control
The Mouse Hotkey command are as follows:

- *Double-click middle + left:*
  Selects the next lower input (same action as **Ctrl Ctrl PageDown**).

- *Double-click middle + right:*
  Selects the next higher input (same action as **Ctrl Ctrl PageUp**).

USB Ports
The SY-KVM41-U3-18G has two USB Type A ports on the rear where the keyboard and mouse should be connected. This enables the use of the hotkey modes as listed on the top of the unit. There are 4x USB Type A ports on the front of the SY-KVM41-U3-18G – two USB 2.0 and two USB 3.0 – these ports may be used for any type of USB device such as storage devices, cameras, audio devices, etc.

Analogue Audio Output
Audio is extracted (de-embed) from the selected source and output via the L/R stereo jack on the front panel.
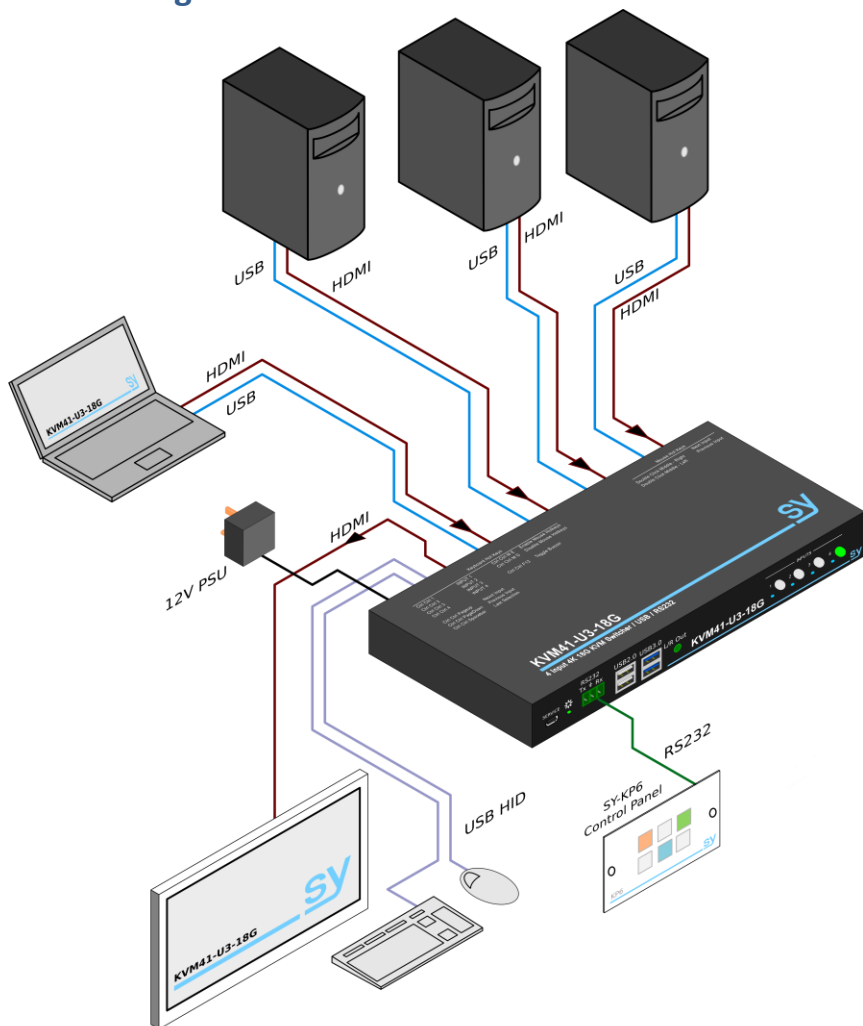
Power Off Memory
The SY-KVM41-U3-18G remembers the last state it was in before being powered down and will return to that state when it is repowered.

Supported PC Operating Systems
The SY-KVM41-U3-18G is will function with the following PC operating systems:

Windows 7, Windows 10, Windows 11, Mac OS, Ubuntu, etc.

Connection Diagram

RS232 Commands

All RS232 commands are sent to the SY-KVM41-U3-18G with these settings:

57600 baud, 8 bits, no parity, and 1 stop bit.

The above settings are the factory default values. The baud rate may be changed using an RS232 command but the number of data bits, stop bits and parity mode cannot be changed.

All RS232 commands are sent using the given case only and must be terminated with a carriage-return character. All indicated spaces are required for the command to function properly.

All RS232 responses are terminated with a carriage-return and line-feed sequence.

Video Selection

The following table lists the commands for video selection and the status of the HDMI input signals:

Command	Description
SET VS IN n	Where **n** is 1~4 for the respective input to select.
SET VS IN U	Select the next higher numbered available input, with wraparound.
SET VS IN D	Select the next lower numbered available input, with wraparound.
SET VS IN T	Toggle between the currently selected input and the previously selected input.
GET VS IN	Get the currently selected input number.

Each of the above commands give the same response:

Response	Description
VS IN n	Where **n** is 1~4 for the selected input.

Output Downscaler

The following table list the commands for controlling the output downscaler mode:

Command	Description
SET DOWNSCALER x	Where **x** is: 0 – Auto downscaling – set best resolution for the display 1 – Always downscale 4K → 2K 2 – No downscaling – output resolution same as input
GET DOWNSCALER	Return the current downscaler setting

Each of the above commands give the same response:

Response	Description
DOWNSCALER x	Where **x** is: 0 – Auto downscaling – set best resolution for the display 1 – Always downscale 4K → 2K 2 – No downscaling – output resolution same as input

HDCP Setting

The commands given in the following table control the HDCP settings:

Command	Description
SET IN n HDCP x	Set the input HDCP mode for input **n**, where **n** is 1~4 for each input respectively. For this command **x** is one of the following: 0 = HDCP off 1 = HDCP 1.4 & HDCP 2.2
GET IN n HDCP	Return the HDCP status input signal for input n, where **n** is 1~4 for each input respectively.
SET HDCP OUT x	Set the output HDCP mode, where **x** is one of the following: 0 = Cascade mode 1 = Follow Input 2 = Auto, change HDCP 2.2 to HDCP 1.4
GET HDCP OUT	Return the output HDCP mode.

Hotkey Modes

The commands given in the following table provide status information:

Command	Description
SET HOTKEY MODE x	Enable or disable the keyboard where **x** is: 0 = disable all keyboard hotkeys 1 = enable all keyboard hotkeys
GET HOTKEY MODE	Return the current enable/disable state of the keyboard hot keys: HOTKEY MODE n
SET MOUSE HOTKEY x	Enable or disable the mouse hotkeys where **x** is: 0 = disable the mouse hotkeys 1 = enable the mouse hotkeys
GET MOUSE HOTKEY	Return the current mouse hotkey status.

EDID Commands

The following table lists the commands for controlling the EDID settings for each input and any of the three user memories:

Command	Description
SET IN n EDID x	Set input n to one of the following EDIDs, where **n** is 1~4 and **x** one of the following values in the range 0~17: 0 – 4K60 4:4:4, 2.0ch 1 – 4K60 4:4:4, 5.1ch 2 – 4K60 4:4:4, 7.1ch 3 – 4K60 4:2:0, 2.0ch, HDR 4 – 4K60 4:2:0, 5.1ch, HDR 5 – 4K60 4:2:0, 7.1ch, HDR 6 – 4K30 4:4:4, 2.0ch, HDR 7 – 4K30 4:4:4, 5.1ch, HDR 8 – 4K30 4:4:4, 7.1ch, HDR 9 – 4K24 4:4:4, 2.0ch, HDR 10 – 4K24 4:4:4, 5.1ch, HDR 11 – 4K24 4:4:4, 7.1ch, HDR 12 – 1080p60, 2.0ch 13 – 1080p60, 5.1ch 14 – 1080p60, 7.1ch 15 – Select USER 1 EDID memory 16 – Select USER 2 EDID memory 17 – Select USER 3 EDID memory
GET IN n EDID	Return the current EDID setting for input **n**, where n is 1~4
SET IN n EDID CY OUT	Copy display EDID to input **n**
SET EDID User b CY OUT	Copy display EDID to User memory **b**, where b is 1~3
SET EDID User b DATA z	Program User **b** with EDID data **z**, where **b** is 1~3 and **z** must be valid EDID data represented as 256 space separated hexadecimal value pairs.
GET EDID User b DATA	Return the EDID contents of User **b**, where **b** is 1~3.

Test Pattern

To aid with installation, the SY-KVM41-18G has a Test Pattern mode that output one of several patterns with a specific resolution:

Command	Description
SET PATTERN t	Set the Test pattern type, where **t** is one of the following: 0 – Black 1 – Chequerboard 2 – Stripes 3 – Red 4 – Green 5 – Blue 6 – White 7 – Ramp 8 – Red Ramp 9 – Green Ramp 10 – Blue Ramp 11 – Pseudo-Random Bit Stream
SET PATTERN RES r	Set the Test pattern output resolution, where **r** is one of the following: 0 – 720x480p60 1 – 1280x720p60 2 – 1080p60 3 – 4K24 4 – 4K25 5 – 4K30 6 – 4K24W (4096x2160) 7 – 4K50 8 – 4K60

Status Information and System Commands

The commands given in the following table provide different types of status information:

Command	Description
GET STATUS	Return All current status information: Selected input, input EDID setting, input HDCP setting, output HDCP setting, test pattern settings and mode, Keyboard Hotkey Mode, Mouse Hotkey Mode, Beep status.
GET VS IN n STATUS	Return the status of the HDMI input signal for input **n**, where **n** is 1~4 for each input respectively. The actual response to this message is dependent on the input HDMI signal resolution, audio channels, EDID, HDCP setting.
GET FW VERSION	Return a list of all the installed firmware versions
SET RESET FACTORY	Reset all configuration parameters to factory defaults.
SET REBOOT	Reboot the SY-KVM341-U3-18G
SET RS232 x	Set the RS232 baud rate, where x is one of the following: 1 = 4800 2 = 9600 3 = 19200 4 = 38400 5 = 57600 6 = 115200
SET BEEP MODE x	Enable or disable the beeper inside the SY-KVM41-U3-18G, where **x** is: 0 = turn the beeper off 1 = turn the beeper on

Command	Description
GET BEEP MODE	Return the status of the beeper: BEEP MODE 0 The beeper is off BEEP MODE 1 The beeper is on

Factory Defaults

Function	Factory Default State
EDID Setting	4K60 4:4:4, 2 ch
User EDID memory	Contents same as above EDID Setting
Input HDCP	HDCP Enabled (accepting both 1.4 & 2.2)
Output HDCP	Auto (HDCP 2.2 changes to HDCP 1.4)
Keyboard Hot Keys	On
Mouse Hot Keys	On
Beep	On
Test Pattern	Chequerboard, 1080p
Serial port settings	57600 baud, 8 bits, no parity , 1 stop bit

Specifications

General

HDMI Resolutions	All resolutions up to 4K60 (18Gbps) 4069 x 2160p & 3840 x 2160p 4:4:4 1080p, 1920 x 1200p with 12 bit deep colour / HDR 1680 x 1060p60, 1920 x 1440p60, 2650 x 1600p60
Refresh Rates	24 Hz, 30 Hz, 50 Hz, 60 Hz
HDMI Standard	1.4b and 2.0
HDMI Colour Space	RGB / YCbCr 4:4:4, 4:2:2, 4:2:0
HDCP Compliance	1.4 and 2.2
Digital Audio	LPCM up to 7.1 channels, up to 24 bits @ 96 kHz Dolby Atmos, Dolby TrueHD, Dolby Digital Plus, Dolby EX Dolby Digital 5.1, Dolby Digital 2/0, DTS-HD Master Audio, DTS-HD, DTS-ES Discrete 6.1, DTS ES Matrix 6.1, DTS Digital Surround 5.1
Analogue Audio (L/R)	Stereo (L/R) 3.5mm jack. Line out (0.7Vrms)
HDMI Cable Length	Inputs: 5m maximum Output: 4K60 4:4:4 5m maximum 4K30 / 1080p60 15m maximum
USB Cable Length	1.8m maximum
Operating Systems	Windows 7, Windows 10, Windows 11, Mac OS, Ubuntu, etc.
PSU	12V 3A
Power Consumption	6W max.

Environmental

Operating Temperature	0 ~ 40°C
Operating Humidity	10 ~ 90% RH (non-condensing)

Physical

Dimensions (WxHxD)	245 x 26 x 104 mm
Weight	650g

Safety Instructions

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

1. **ONLY USE** the power supply provided. If an alternate supply is required, check the voltage, polarity and that it has sufficient power to supply the device it is connected to.

2. **DO NOT** operate this product outside the specified temperature and humidity range given in the above specifications.

3. Ensure there is adequate ventilation as this product generates heat while operating.

4. Repair of this product should only be carried out by qualified professionals as this product contains sensitive devices that may be damaged by any mistreatment.

5. Only use this product indoors and in a dry environment. **DO NOT** allow any liquids or harmful chemicals to come into contact with this product.

After Sales Service

1. Should you experience any problems while using this product, firstly refer to the Troubleshooting section in this manual and/or your local dealer before contacting SY Technical Support.

2. When calling SY Technical Support, please provide the following information:
   - Full 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. For full details please refer to our Terms and Conditions.

4. The 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.