TESmert TESmart

User Manual

4x3 HDMI KVM Switch

4K LCD

HKS0403A1U

To Enjoy Smart

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English

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Preface

It's our great honor that you have chosen the HDMI KVM Switch produced by our company, Tesla Elec Technology Co.,Ltd. In this user manual, you will learn how to operate and use this product. Please read this user manual comprehensively before use. If you have any questions, comments or suggestions, please contact us via the following email:
support@tesmart.com.

Copyright Notice

Address of Manufacture
Tesla Elec Technology Co.,Ltd 2F,
Building C, Xingzhisheng Industrial Park, No.12, Xiawei
Industrial Zone, Zhangkengjing Road, Guanlan Street,
Longhua District, Shenzhen City,
Guangdong Province, China

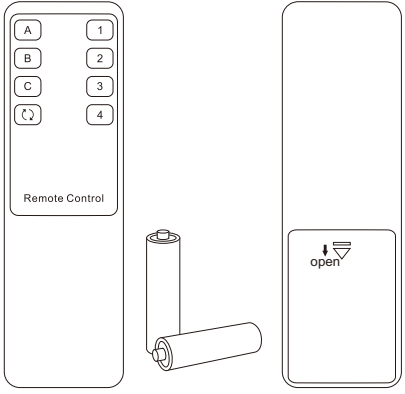
Contents

1. Safety Tips and Warnings

Tips: Please read the safety tips and warnings for HDMI KVM Switch comprehensively before use. Use this produce in accordance with its instructions, safety tips and warnings to prevent unnecessary damage to the product and potential dangers to users.

- Keep the product away from water.
- Clean the product with dry cloth.
- Use the product in accordance with its instructions and do not block its vents.
- Keep the product away from ignition sources, such as heat sinks, heat accumulators, stovepipes and other heat production settings (including audio amplifiers).
- Do not touch the product and the power cord with wet hands so as to lower the risk of electric shock and damage to the product. Do not let the product get wet or become damp.
- Unplug the power supply of this product in thunderstorm days or when it has been not used for a long time.
- Do not expose this product and its battery to open fire or overheating environment. Dispose the waste battery in accordance with instructions.
- Users shall not remove and repair the product without authorization.

2. Battery Description



Tips: By default, the remote control is not equipped with batteries, due to the safety requirements of some express companies. Install AAA dry cells before use.

Caution: Improper disposal of the lithium battery may cause an explosion. Do not throw the battery into fire. Keep the battery away from children. Dispose the waste battery in accordance with local regulations.

3. Warranty Information

We warrant this product as free of defects in material and workmanship for a period of one (1) year from the date of shipment. If during the period of warranty this product proves defective under normal use, we will repair or replace this product, provided that this product has not been subjected to mechanical, electrical, or other abuse or modifications. If it fails under conditions other than those covered will be repaired at the current price of parts and labor in effect at the time of repair. Such repairs are warranted for six (6) months from the day of reshipment to the buyer.

4. Preface

Dear Users,

HDMI KVM Switch can easily integrate cross-platform computer devices and greatly simplify the devices management. Support managing a triple-display multimedia workstation. If you connect 3 HDMI ports of the same PC to one group of input ports on the KVM, you will realize 3-screen extended display or copy display. It has the same effect as connecting the PC directly to 3 displays. The KVM also supports displaying different PCs on 3 monitors.

This KVM supports using USB hubs and USB keyboard and mouse. It also supports locking L/R audio and USB 2.0 devices to a fixed PC. Support several switching modes. You can switch input ports with front panel keypad, IR signals, keyboard hot keys and RS232 commands. At the same time, with EDID emulators in each input port, it can keep PCs always having correct display information.

Tips: If you need to control more computers or conduct more complex and professional switching, you can also choose other products of our company. For more details, please visit our official website:

5. Features

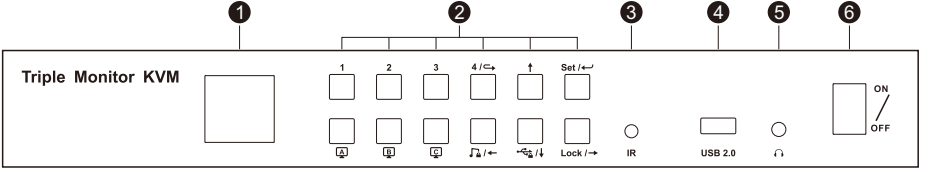
- Using 3 monitors, 1 set of keyboard and mouse to control 4 computers
- Support resolution up to 3840x2160@60Hz 4:4:4
- HDMI 2.0 compliant
- HDCP 2.2 compliant
- Support HDR 10 and Dolby Vision
- Support 2 display modes
- Support Unix/Windows/ Debian/ Ubuntu/Fedora/ MacOS X/ Raspbian/ Ubuntu for Raspberry Pi and other Linux based systems
- Support L/R audio output
- Support locking L/R audio and USB 2.0 devices to a fixed PC
- With EDID emulators in each input port, it can keep PCs always having correct display information
- Support function settings on the front panel which can switch ports, turn on/off auto scan, change hot key trigger, lock audio and USB 2.0 and other functions
- Support keyboard and mouse pass through mode to improve mouse and keyboard compatibility
- Support IR signals, front panel buttons, keyboard hot keys and RS232 commands to switch input ports

6. Packing List

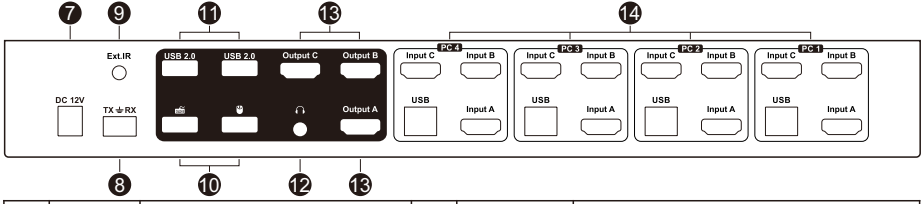
- 1 * 4x3 HDMI KVM Switch
- 4 * KVM Cables
- 8 * HDMI Cables
- 1 * IR Remote Control
- 1 * IR Extension Cable
- 1 * 3 Pins Connector (For RS232)
- 1 * DC 12V Power Adapter
- 1 * User Manual
- 2 * Rack-ears

Tips: After receipt of the product, please check the packing list carefully to make sure that no components have been lost and no damage to the product has been caused during transportation. If you have any problem, please contact us at any time.

7. Panel Description



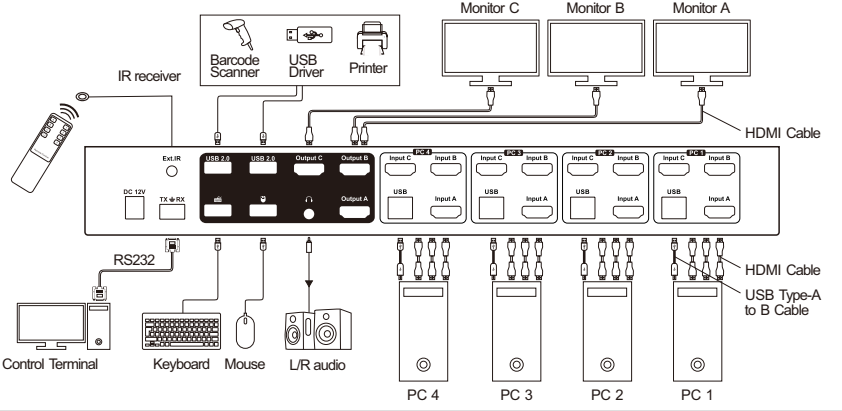
ID	Name	Function
1	Color LCD	Display current status and function settings.
2	Keypad	Press to control the KVM. Please refer to Chapter 10.1 for the detail.
3	IR receiver	Receive IR remote signal.
4	USB 2.0 port	Connect to USB 2.0 device.
5	L/R out	Connect to L/R output device.
6	Power switch	Turn on or turn off power supply.



ID	Name	Function	ID	Name	Function
7	DC 12V	12V DC power supply.	11	USB 2.0 ports	Connect to USB 2.0 devices.
8	RS232 port	Connect RS232 cable to use RS232 commands to control the Switch.	12	L/R out	Connect to L/R output device.
9	IR extension in	Connect IR extension cable to this port to receive IR signal even the KVM is installed in a rack.	13	HDMI outputs	Connect to 3 HDMI displays for video output.
10	Keyboard and mouse input	For USB keyboard and mouse input.	14	KVM input ports group	4 PCs can be connected to the KVM at the same time. Each group contains 3 HDMI ports(marked as Input A/B/C) and a USB port. Connect the ports to corresponding input devices for signal input.

8. Connection Description

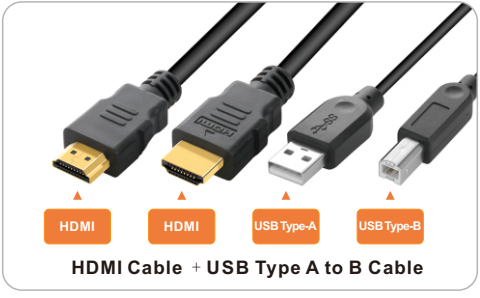
8.1 Connection Diagram



Tips: For your better use of this product, we recommend that you connect all 3 input ports on each KVM input port group to the same PC.

8.2 Connection Preparation

- Take into consideration all devices required to be connected and prepare a workbench large enough before the connection.
- Lay out the cables properly to facilitate the layout of power supply as a lot of power sockets and plug boards will be adopted in connection.
- Prepare different sticker labels to mark cables as a lot of cables will be adopted in connection.



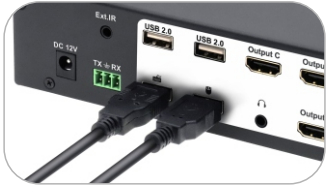
HDMI Cable + USB Type A to B Cable

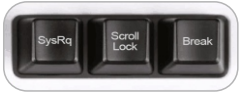
8.3 Connection Steps

1. Connect PC 1 with 2 HDMI cables and 1 KVM cable.

2. Connect PC 2~4 with the same method.

3. Connect external mouse and keyboard to KVM's keyboard and mouse input port.



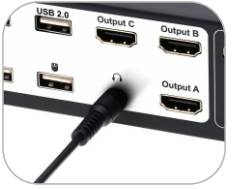


Tips: For the normal service of hotkeys, we recommend you use the full-key external keyboard with a separate [Scroll Lock] key (as shown **above**).

4. Connect USB 2.0 devices to KVM's standard USB 2.0 ports.

5. Connect KVM's HDMI output ports to 3 HDMI displays with 3 HDMI cables.

6. Connect external audio device to KVM's L/R out port.



7. Connect the power cable to KVM's DC 12V port and plug it to a power socket.

8. By now, the connection has been completed. Turn on the power supply and the KVM Switch will begin to work.

8.4 KVM Workbench

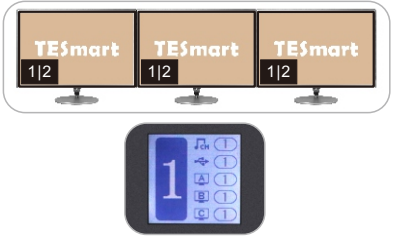
A workbench with 4x3 KVM Switch successfully connected is shown as below:

9. Function Description

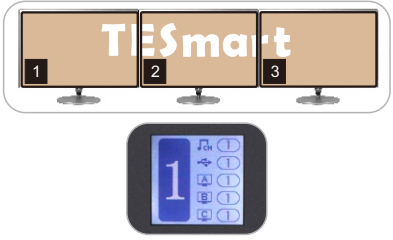
9.1 Display Mode Description

The 4x3 KVM Switch support 2 display mode. You can choose to implement 3-screen extended display or duplicate display or display different PCs on 3 monitors.

Display Mode 1:
Duplicate 3 displays



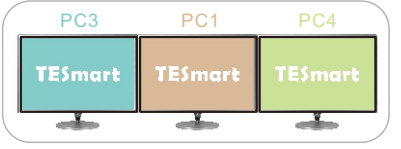
Extend 3 displays

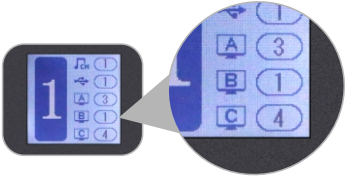


Tips: You can set the duplicate mode or extend mode in the Display Settings of the current selected PC.

9.1 Display Mode Description

Display Mode 2:
Display different Pcs on 3 monitors





In this mode, each input and output port on the KVM is marked with a letter, and the screen corresponding to the output port is output by the port with the corresponding letter of the PC selected. As shown in the figure above, the screen output by the monitor connected to Output A is from Input A of PC 3, the screen on Output B is from Input B of PC 1, and the screen on Output C is from Input C of PC 4.

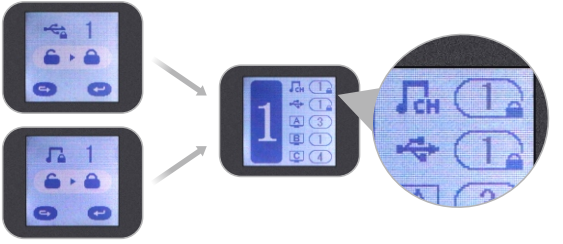
When different PCs are displayed on different monitors, you can double-click the right [Alt] to switch the focus between different PCs.

Tips: 1. When any PC is expanded to display 3 screens, there is only one main display, and it is fixed to the display connected to a certain output port when switching (which display is determined by the Windows system). If you need to switch the main screen to display on other output displays, you need to manually change the target display to the main display in the Display Settings on the current selected PC.

2. Please refer to Chapter 10 for detailed information about how to switch between different modes.

9.2 Lock L/R Audio and USB Focus Function

The 4x3 KVM Switch supports locking L/R audio and USB 2.0 focus. After the lock is turned on, the current audio or USB focus can be maintained and only the screen can be switched when switching; the audio focus lock and USB 2.0 focus lock are independent of each other, you can lock the audio or lock the USB separately. Only need to press the front panel keys to operate audio or USB focus lock.

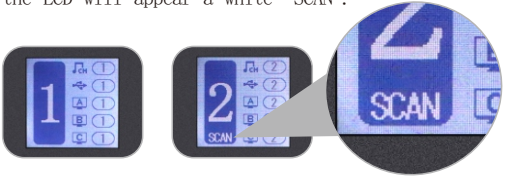


Tips: 1. The keyboard & mouse focus and USB focus are independent of each other, and the keyboard and mouse focus cannot be locked. When switching between different input sources in display mode 2, the keyboard and mouse focus will not change with the switch.
2. The lock state is automatically released after the KVM is powered off.
3. Please refer to Chapter 10.1 for detailed information about how to lock/unlock audio or USB.

9.3 Auto Scan Mode Description

The Auto Scan feature can automatically switch the display at regular intervals between the input devices that are powered on and connected to the KVM. As a result, any input devices connected to each port can be monitored without user intervention. Auto scan mode is off by default. You can turn on the auto scan mode through the front panel keypad, keyboard hot key, infrared remote control, etc.

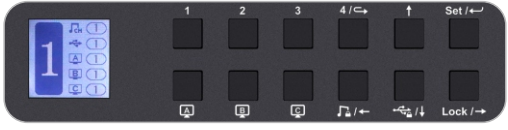
After the auto scan mode is turned on, the lower left corner in the main menu interface of the LCD will appear a white "SCAN".



Tips: 1. When auto scan mode is turned on, regardless of the current routing status, all monitors will display PC 1 at first. When scanning, switch in the order of PC 1-4, and all displays will display the same PC every time it switches.
2. Please refer to Chapter 10 for detailed information about how to turn on/off the auto scan mode.

10. Operation Method

10.1 Front Panel Button Switching Method

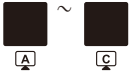


When you use the front panel button or IR remote to control the KVM, the LCD display will inquiry your target action, then execute the command according to your operation. The LCD interface in the figure above is the main interface.

Schematic table of LCD interface and panel icons:

Icons	Meaning and function
	Monitor A B C.
	Audio focus icon, indicating the PC where the external audio focus is currently located.
	USB focus icon, indicating the PC where the external USB 2.0 device focus is currently located.
	Keyboard and mouse focus icon, indicating the PC where the keyboard and mouse focus is currently located.
	Audio lock icon, indicating that the current audio is locked on the PC corresponding to the number behind the  icon on the main interface.
	USB lock icon, indicating that the current USB 2.0 devices are locked on the PC corresponding to the number behind the  icon on the main interface.
	Return button.
	Enter button.

1~4 button:
1. Press directly to switch among 4 PCs. After switching, 3 displays will display the selected PC at the same time, i.e. display mode 1.
2. In the settings interface, press [4 /] to return to the main interface.



Display selection button:
Directly press the button, then press the [1~4] buttons according to the prompt of the LCD screen to make the selected monitor display the selected PC. i.e. display mode 2.

Audio lock button:
1. Directly press [/] button, follow the prompts on the LCD screen, then press the [/] button to lock the L/R audio to the current PC. Any operation after locking will not change the locked state. Press the Set key again in the locked state, and then press the [/] button to unlock.
2. In the menu and setting interface, press [Set /] button to page forward or select to the left. [/]

USB lock button:

1. Directly press [ ] button, follow the prompts on the LCD screen, then press the [ ] button to lock the external USB 2.0 devices to the current PC. Any operation after locking will not change the locked state. Press the key again in the locked state, and then press the [ ] button to unlock.
2. In the settings menu, Press [ ] button to select down.

Select up button:

In the settings menu, Press [ ] button to select up.

Lock button:

1. Press [ ] button to lock the KVM. After locking, all displays will be off, audio output will be paused, and LCD screen brightness will be reduced to a minimum, all buttons will be invalid. Press [ ] button again to light up the LCD screen, then enter the password to unlock.
2. In the menu and setting interface, press [ ] button to page backward or select to the right.

Tips: 1. You can change your password in settings menu.
2. If you forget your password, you can restore the factory default settings to unlock. The default password is 1234. Press and hold the [Lock /→] for about 10 seconds to restore the factory default settings.
3. IR remote control and keyboard hot keys are invalid when KVM is locked.

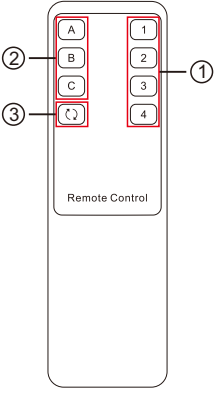
Set /↩ Settings button:

1. Press the button, according to the LCD screen prompts, you can set up save or load preset scenes, enable or disable auto scan, set auto scan time, enable or disable buzzer, set hotkey trigger key, set screen brightness, change password in the menu. Use the [ ] key to select among different options under each setting.
2. In the menu and setting interface, press [Set /↩] button to confirm.

Tips: 1. Only numbers 1, 2, 3, 4 on the front panel of the KVM are available when changing passwords. You can also set a password to null to unlock without a password.
2. Under the password modification interface, the button [/←] is used as the return button.

Tips: The setting status in the interface is automatically synchronized with the current settings, and the selected option is indicated by the dark color.

10.2 IR Remote Control



① Press directly to select among 4 PCs, and 3 displays will display the selected PC at the same time. (i.e. display mode 1)

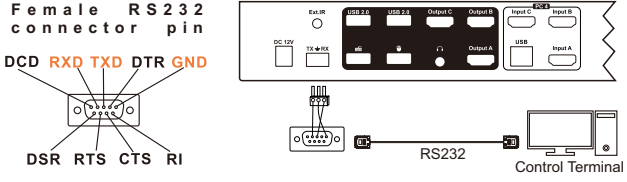
② Press the key, and then press the [1~4] key to make the selected monitor display the selected PC. (i.e. display mode 2)

③ Turn on/off auto scan mode.

10.3 RS232 Control

A. Connect RS232 port

Follow the below diagram to connect the standard 9 pin RS232 port to the 3 pins connector which is included in package, then plug the connector to the ' TX ⏚ RX ' port of the HDMI switch.



B. Communication protocol

RS232 port configuration:
Baud rate: 9600 bps
Stop bit: 1 bit
Data length: 8 bits
Parity bit: None

The commands are as the following form(Hexadecimal):

Index	Command strings	Parameter description	Remark
1	AA BB 02 01 XX	XX: input port number(01~04)	All outputs are switched to selected inputs
2	AA BB 02 XX YY	XX: output port letter(0A~0C) (Hexadecimal) YY: input port number(01~04)	Make the selected monitor display the selected PC
3	AA BB 02 08 XX	XX: 00: turn off auto scan 01: turn on auto scan	Auto scan mode status
4	AA BB 03 09 XX YY	XX: minutes; YY: seconds	Set the auto scan time interval
5	AA BB 02 05 01		Switch focus on display mode 2
4	AA BB 02 0D XX	XX: 00: unlock USB XX: 01: lock USB	Lock USB 2.0 devices focus
5	AA BB 02 0E XX	XX: 00: unlock audio XX: 01: lock audio	Lock L/R audio devices focus

C. 4x3 HDMI KVM Switch Controller

Based on the communication protocol in Section B, you can develop dedicated controllers for each platform.

10.4 Keyboard Hot Keys

→ Use external keyboard hot keys to switch the input source.

Tips: The keyboard hot keys can only work with external keyboard correctly connected to the keyboard and mouse input port of the KVM. For the use of hot keys, we recommend you use an external keyboard with a separate [Scroll Lock] key.

After press [Scroll Lock] key twice within 2 seconds and you will hear the buzzer beep once, please enter the commands within 3 seconds and the KVM will execute the corresponding commands.

Select previous input port:
[Scroll Lock] [Scroll Lock] [PgUp]

Select next input port:
[Scroll Lock] [Scroll Lock] [PgDn]

Select port by port number(i.e. display mode 1):
[Scroll Lock] [Scroll Lock] [1]~[4]

Switch PCs on different monitors separately(i.e. display mode 2):

Monitor A [Scroll Lock] [Scroll Lock] [ ] [1]~[4]

Monitor B [Scroll Lock] [Scroll Lock] [ ] [1]~[4]

Monitor C [Scroll Lock] [Scroll Lock] [ ] [1]~[4]

Switch focus in display mode 2:
[Right-Alt]→[Right-Alt]

Turn on auto scan mode:
[Scroll Lock] [Scroll Lock] [Space]

Tips: The default auto scan time interval is 6 seconds. You can change the time interval by setting on the LCD menu or following the step presented below.

Increase or decrease auto scan time interval:
[Scroll Lock] [Scroll Lock] [+]/[-]

Tips: This hot key command can only work while the auto scan mode is activated. Press [Scroll Lock] twice and keep pressing [+]/[-] key to adjust the time interval continuously. Increase or decrease 1 second at one time.

Press [Esc] to exit auto scan mode.

Disable or enable buzzer sound:
[Scroll Lock] [Scroll Lock] [F11]

Tips: The default setting of buzzer sound is enabled. Repeat this step to disable or enable buzzer

11. Change Hot Key Combinations

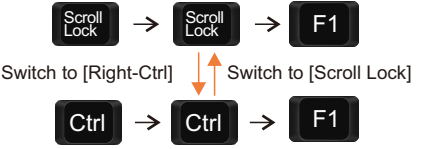
There are two kinds of trigger hot keys in this product, the default is [Scroll Lock] key, and the alternative is the [Right-Ctrl] key. If [Scroll Lock] Key has been used for other functions, you can switch the hot key to [Right-Ctrl] by:

Method 1:

→ Change the hot key through the settings in the LCD menu, press the [Set /↵] key and find the "Hot key" option to set.

Method 2:

→ Press [Scroll Lock] [Scroll Lock] [F1], and you will switch the control hot key to [Right-Ctrl].



→ Vice verse, Press [Right-Ctrl] [Right-Ctrl] [F1], and you will switch the control hot key to [Scroll Lock].

12. Pass Through Mode Description

12.1 Introduction of Pass through mode

Pass through mode is a built-in function of KVM, which is able to improve keyboard and mouse compatibility and enhance user experience. In the pass through mode, the keyboard and mouse are equivalent to directly connecting to the computer. At this time, you can use more keyboard and mouse functions and special functions that are not supported by traditional KVM.

Tips: The current version does not support keyboard and mouse connection via Bluetooth.

12.2 Keyboard and mouse compatible model list

Tips: The following list is from the most representative models of keyboard and mouse that have been tested in the laboratory, mainly from manufacturers with a high market share.

Brand	Model	Brand	Model	Brand	Model	Brand	Model
Agio	WQ-641	**Logitech**	G510	**Logitech**	Marble Mouse	**RAPOO**	X220
Dell	KB212-B	**Logitech**	G710	**Logitech**	Mk540	**RAZER**	RZ01-0145
Dell	KB522	**Logitech**	G910	**Logitech**	Mx1100	**RAZER**	RC30-021203
Logitech	G105	**Logitech**	K400PLUS	**Logitech**	Mx518	**Corsair**	K55
Logitech	G500S	**Logitech**	K845	**Microsoft**	Wireless Desktop 2000	**Corsair**	K70LUX

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