Emerson® Cybex™ SC Switching System

Installer/User Guide

EMERSON.
Network Power

NOTE: This document supports versions up to and including release 1.0.

TABLE OF CONTENTS

Product Overview

Emerson® Cybex™ SC switches are field-proven, secure, KVM and KM switching solutions with special support for government agencies. This switching system allows users to switch safely between computers operating at different classification levels from a single set of peripherals, providing continuous access to critical data. With multiple security features, the secure design prevents the transfer of data between the connected computers, ensuring data security is not compromised.

WARNING: This product is equipped with active intrusion protection and tamper-evident seals. Tampering with the switch or breaking/removing the seals will permanently disable it and void the warranty. If the enclosure appears to have been tampered with or if all the port LEDs flash continuously, please contact Technical Support.

Features and Benefits

The SC switching system offers several options depending on the model:

- Support for HDMI, DVI-I and DisplayPort video
- Support for Common Access Card (CAC), USB biometric device and USB authentication token
- Certification to Evaluation Assurance Level (EAL) 4+
- Support for USB and PS/2 keyboard and mouse

The SC switching system is also designed to provide additional layers of security, preventing unintended data leaks between computers and providing additional USB port protection.

Security and Protection Features

Feature	Description
Complete network segmentation	Data flow is controlled and insulated from peripheral devices using optical data diodes. EDID emulators and internal firewalls protect shared displays and prevent external memory leaks.
Protection from shared resources	The switches are designed to securely operate, even when peripheral devices are vulnerable to signaling attacks. They do not allow computer access to any shared resource and do not share controllable power sources.
Non-reprogrammable firmware	Custom firmware is not reprogrammable preventing the ability to remotely attack

Feature	Description
	switch controllers.
Audio protection	Microphone switching is not supported to prevent data leaks through audio ports.
CONSOLE USB port protection	CONSOLE USB ports protect from the use of unsafe USB storage devices. Unqualified devices are rejected when connected through the switch even though keyboard and mouse data is passed through.

Basic Operation

Although installation of your SC switching system is complete, ensure you have have one of the following compatible operating systems:

- Microsoft® Windows®
- Red Hat® Linux®
- Ubuntu® Linux®
- Other Linux distributions
- Mac OS® X v10.3 and higher

Switch Overview

The following figures show the connectors on the front and back of the switching system.

KVM Model (SC 945 Switch Shown)
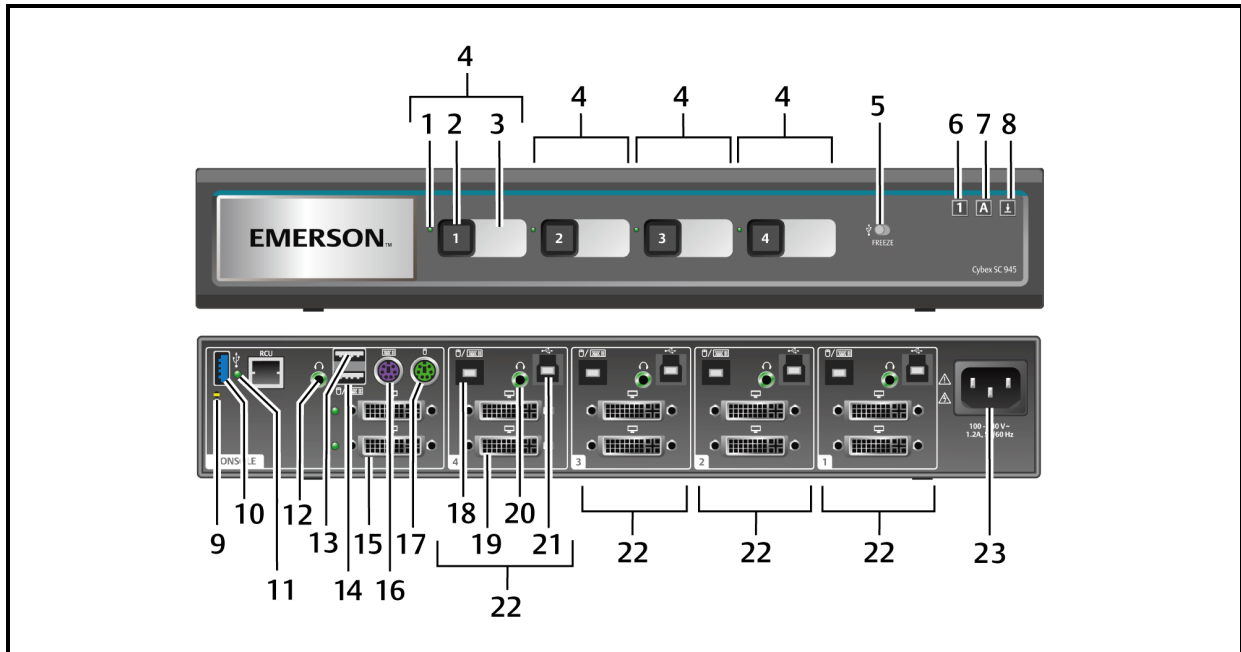
KVM SC 945 Switch Description

Number	Description	Number	Description
1	LED channel indicator	13	CONSOLE high-speed USB type A port
2	Channel selector	14	CONSOLE full-speed USB type A port
3	Channel label	15	CONSOLE female video port (varies with model: DVI-I, HDMI or

Number	Description	Number	Description
			DisplayPort)
4	Channel configuration	16	Keyboard PS/2 mini-DIN 6 pin female port
5	Dedicated Peripheral Port (DPP) freeze toggle	17	Mouse PS/2 mini-DIN 6 pin female port
6	Num lock indicator*	18	Keyboard and mouse USB type b port
7	Caps lock indicator*	19	Varies with model (DVI-I, HDMI or DisplayPort)
8	Scroll lock indicator*	20	Audio jack (3.5 mm stereo)
9	CONSOLE system reset	21	DPP USB type B port (CAC support: only available on some models)
10	CONSOLE DPP USB type A port (CAC support: only available on some models)	22	Channel configuration
11	DPP LED indicator: Green: Functioning Flashing green: Rejected device (not authorized) None: Device not operating, non-standard USB device or device only operating in USB 3 mode	23	AC input (100-200 VAC)
12	CONSOLE audio jack (3.5 mm stereo)		

NOTE: *When these LED indicators are lit, they reflect the status of the keyboard functions on the active channel.
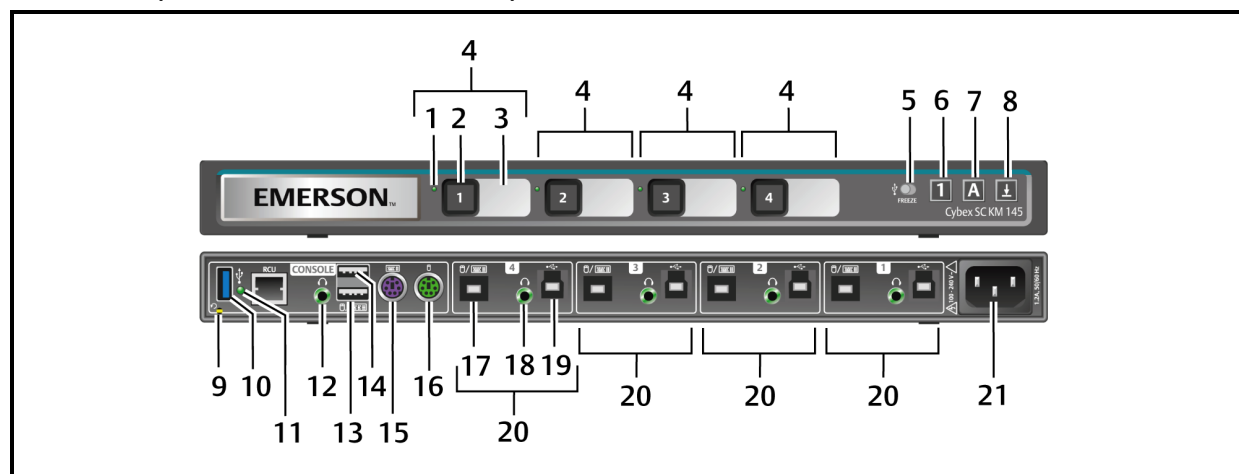
KM Model (SC KM145 Switch Shown)

KM SC KM145 Switch Description

Number	Description	Number	Description
1	LED channel indicator	12	CONSOLE Audio jack (3.5 mm stereo)
2	Channel selector	13	CONSOLE keyboard and mouse full-

Number	Description	Number	Description
			speed USB type A ports
3	Channel label	14	CONSOLE keyboard and mouse high-speed USB type A ports
4	Channel configuration	15	Keyboard PS/2 mini-DIN 6 pin female port
5	Dedicated Peripheral Port (DPP) Freeze Toggle	16	Mouse PS/2 mini-DIN 6 pin female port
6	Num lock indicator*	17	Keyboard and mouse USB type B port
7	Caps lock indicator*	18	Audio jack (3.5 mm stereo)
8	Scroll lock indicator*	19	DPP USB type B port (CAC support: only available on some models)
9	CONSOLE System reset	20	Channel configuration
10	CONSOLE DPP USB type A port (CAC support: only available on some models)	21	AC input (100-200 VAC)
11	DPP LED indicator: Green: Functioning Flashing green: Rejected device (not authorized) None: Device not operating, non-standard USB device or device only operating in USB 3 mode		

NOTE: *When these LED indicators are lit, they reflect the status of the keyboard functions on the active channel.

Switching between computers

After turning on the switch, the default channel is channel one. You can select which computer to operate using front panel push-buttons.

To switch between computers:

Select the computer by pressing the corresponding front panel push-button on the front of the switch. The LED number will illuminate to indicate which computer is currently selected. It will take approximately one second for the video signal to sync after switching computers.

The following table details keyboard shortcut options for KM models.

KM Keyboard Shortcuts

Key Combination	Description
**CTRL	CTRL	F11	r**	Device resets to factory defaults and all settings and configurations are deleted.
**CTRL	CTRL	F11	f**	Disable cursor navigation. Switching between systems will not be possible with mouse movement.
**CTRL	CTRL	F11	u**	Enable cursor navigation. Switching between systems is possible with mouse movement.

Key Combination	Description
CTRL | CTRL | F11 | +	Mouse speed is increased.
CTRL | CTRL | F11 | -	Mouse speed is decreased.

Dedicated Peripheral Port (DPP)

A DPP (enabled by default) allows secure use of CAC, smart-card readers, fingerprint readers, face recognition and iris recognition devices. The host detection function of the DPP enables the user to switch between ports without disconnecting the user authentication session, known as DPP freeze. When locked, switching channels will not affect processes performed by the USB device connected to the locked channel. If only one computer is using the DPP function, ensure that it is connected to channel one.

NOTE: Do not connect a cable to the DPP if an authentication device is not needed. The switch will automatically detect a cable and attempt to program the DPP selection logic. If you are connecting to the DPP, your device must be fully compliant with a standard USB 1.1 or USB 2.0 and turned on.

Using DPP freeze

If you need to retain authentication information on one channel after switching to another, you can freeze the DPP of the first channel.

To freeze the DPP channel:

1. Select the DPP channel you want to freeze.
2. On the front panel, switch the DPP freeze button.
3. Toggle to FREEZE mode. The channel indicator will illuminate on the selected channel and on the FREEZE toggle.

NOTE: If you are on a channel that has a DPP enabled and you switch to a channel that is not using a DPP, then you will lose the connection and the ability to freeze the information. You must switch back to a DPP-enabled channel to reactivate the feature.

KM multi-monitor support

The SC KM145 switch is preconfigured to support one monitor per channel. The user can use the preset keys to configure the KM to support more than one monitor per channel. To leverage the multiple monitor feature, the user must install the multiple monitor driver on each of the desired systems. When using the multiple monitor configuration, the user can experience seamless switching by moving the mouse cursor to the desired display. To download the multi-monitor display driver, visit www.Emerson.com.

The following images detail the different preset monitor configurations.

NOTE: In the configurations, gray indicates a single computer and black indicates a multi-monitor display.

P indicates the primary display and S indicates a the seconday display in a multi-monitor display configuration.

Two Port KM Presets

F11│F1	`1` `2`	F11│F9	`1P` `1S` `2P` `2S`
F11│F2	`1` / `2`	F11│F10	`1` / `2P` `2S`
F11│F3	`1P` `1S` / `2P` `2S`	F11│1│1	`1P` `1S` / `2`
F11│F4	`1P` `2P` / `1S` `2S`	F11│1│2	`1` `2P` / `2S`
F11│F5	`1` `2P` `2S`	F11│1│3	`1P` `1S` `2`
F11│F6	`1P` `1S` `2`	F11│1│4	`2P` / `1P` `1S` `2S`
F11│F7	`1P` `1S` `1S` `2`	F11│1│5	`1` / `2P` / `2S`
F11│F8	`1` `2P` `2S` `2S`	F11│1│6	`1P` / `1S` / `2`

F11│1│7	`2P` / `1` `2S`
F11│1│8	`1` `2S` `2S` / `2P` `2S`
F11│1│9	`2P` `2S` / `1` `2S` `2S`
F11│1│0	`1P` `1S` / `2P` `2S` `2S` `2S`
F11│2│1	`1P` `1S` `1S` `1S` / `2P` `2S`
F11│2│2	`1P` `1S` / `1S` `1S` `2`
F11│2│3	`1P` `1S` `2` / `1S` `1S`
F11│2│4	`1P` `1S` `1S` / `2P` `2S` `1S`

Four Port KM Presets

Preset	Layout		Preset	Layout		Preset	Layout
F11│F1	1 2 / 3 4		F11│1│2	1 / 2 3		F11│2│3	2 3 4 / 1P 1S
F11│F2	1 2 3 4		F11│1│3	1 / 2 3		F11│2│4	1 2P 2S 3
F11│F3	1P 1S / 3P 3S		F11│1│4	1 2 / 3		F11│2│5	1 / 2
F11│F4	1P 3P / 1S 3S		F11│1│5	1 2 / 3		F11│2│6	1 2
F11│F5	1 2 3P 3S		F11│1│6	1 / 2 3 4		F11│2│7	1 2 / 3
F11│F6	1 2P 2S 4		F11│1│7	1 / 2 3 4		F11│2│8	3 / 1 2
F11│F7	1P 1S 3 4		F11│1│8	2 3 4 / 1		F11│2│9	2 / 1 3
F11│F8	1P 1S 3P 3S		F11│1│9	1 2 / 3P 3S		F11│2│0	2 / 3 1
F11│F9	1 2 3		F11│1│0	3P 3S / 1 2		F11│3│1	1P / 1S 2P 2S 3
F11│F10	1 / 2 3 4		F11│2│1	1 3P / 2 3S			
F11│1│1	1 / 2 / 3		F11│2│2	3P 1 / 3S 2			

Technical Support Site

If you encounter any installation or operational issues with your product, check the pertinent section of this manual to see if the issue can be resolved by following outlined procedures. For additional assistance, visit www.avocent.com/support.

Avocent Community Support Site

To search product knowledge content,
visit community.emerson.com/networkpower/support/avocent.

About Emerson Network Power

Emerson Network Power, a business of Emerson (NYSE:EMR), delivers software, hardware and services that maximize availability, capacity and efficiency for data centers, healthcare and industrial facilities. A trusted industry leader in smart infrastructure technologies, Emerson Network Power provides innovative data center infrastructure management solutions that bridge the gap between IT and facility management and deliver efficiency and uncompromised availability regardless of capacity demands. Our solutions are supported globally by local Emerson Network Power service technicians. Learn more about Emerson Network Power products and services at **www.EmersonNetworkPower.com**.

590-1240-501B

EMERSON. CONSIDER IT SOLVED.