

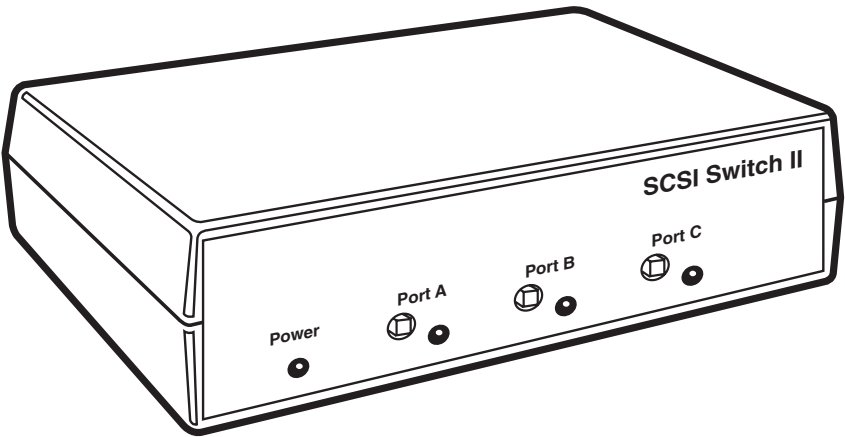


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SCSI Switch II



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RADIO FREQUENCY INTERFERENCE STATEMENTS**

This equipment generates, uses, and can radiate radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio communication. It has been tested and found to comply with the limits for a Class A computing device in accordance with the specifications in Subpart J of Part 15 of FCC rules, which are designed to provide reasonable protection against such interference when the equipment is operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user at his own expense will be required to take whatever measures may be necessary to correct the interference.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This digital apparatus does not exceed the Class A limits for radio noise emission from digital apparatus set out in the Radio Interference Regulation of Industry Canada.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la classe A prescrites dans le Règlement sur le brouillage radioélectrique publié par Industrie Canada.

**NORMAS OFICIALES MEXICANAS (NOM)
ELECTRICAL SAFETY STATEMENT****INSTRUCCIONES DE SEGURIDAD**

1. Todas las instrucciones de seguridad y operación deberán ser leídas antes de que el aparato eléctrico sea operado.
2. Las instrucciones de seguridad y operación deberán ser guardadas para referencia futura.
3. Todas las advertencias en el aparato eléctrico y en sus instrucciones de operación deben ser respetadas.
4. Todas las instrucciones de operación y uso deben ser seguidas.
5. El aparato eléctrico no deberá ser usado cerca del agua—por ejemplo, cerca de la tina de baño, lavabo, sótano mojado o cerca de una alberca, etc..
6. El aparato eléctrico debe ser usado únicamente con carritos o pedestales que sean recomendados por el fabricante.
7. El aparato eléctrico debe ser montado a la pared o al techo sólo como sea recomendado por el fabricante.
8. Servicio—El usuario no debe intentar dar servicio al equipo eléctrico más allá a lo descrito en las instrucciones de operación. Todo otro servicio deberá ser referido a personal de servicio calificado.
9. El aparato eléctrico debe ser situado de tal manera que su posición no interfiera su uso. La colocación del aparato eléctrico sobre una cama, sofá, alfombra o superficie similar puede bloquea la ventilación, no se debe colocar en libreros o gabinetes que impidan el flujo de aire por los orificios de ventilación.
10. El equipo eléctrico deber ser situado fuera del alcance de fuentes de calor como radiadores, registros de calor, estufas u otros aparatos (incluyendo amplificadores) que producen calor.
11. El aparato eléctrico deberá ser conectado a una fuente de poder sólo del tipo descrito en el instructivo de operación, o como se indique en el aparato.

12. Precaución debe ser tomada de tal manera que la tierra física y la polarización del equipo no sea eliminada.
13. Los cables de la fuente de poder deben ser guiados de tal manera que no sean pisados ni pellizcados por objetos colocados sobre o contra ellos, poniendo particular atención a los contactos y receptáculos donde salen del aparato.
14. El equipo eléctrico debe ser limpiado únicamente de acuerdo a las recomendaciones del fabricante.
15. En caso de existir, una antena externa deberá ser localizada lejos de las líneas de energía.
16. El cable de corriente deberá ser desconectado del cuando el equipo no sea usado por un largo periodo de tiempo.
17. Cuidado debe ser tomado de tal manera que objetos líquidos no sean derramados sobre la cubierta u orificios de ventilación.
18. Servicio por personal calificado deberá ser provisto cuando:
 - A: El cable de poder o el contacto ha sido dañado; u
 - B: Objetos han caído o líquido ha sido derramado dentro del aparato; o
 - C: El aparato ha sido expuesto a la lluvia; o
 - D: El aparato parece no operar normalmente o muestra un cambio en su desempeño; o
 - E: El aparato ha sido tirado o su cubierta ha sido dañada.

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1. Specifications

Compliance —	UL®, CSA, FCC Part A, CE
Protocol —	Synchronous and asynchronous
Standards —	SCSI-1, SCSI-2, and SCSI-3
Interface —	Single-ended
Termination —	All branches must be terminated externally
SCSI ID —	None
User Controls —	(3) Pushbuttons for branch selection (Port A, B, or C)
Indicators —	(1) Power, (3) Branch-connected LEDs
Connectors —	(1) P5 2.1-mm female power jack, (4) high-density 68-pin SCSI-3
Enclosure —	ABS plastic
Operating Temperature —	32 to 158°F (0 to 70°C)
Storage Temperature —	-4 to +212°F (-20 to +100°C)
Humidity —	10 to 95%, noncondensing
Maximum Altitude Tolerance —	15,000 feet (4570 m)
Power —	SW845A-R2: 120 VAC wallmount, 9 VDC @ 500 mA; SW845AE-R2: 100–260 VAC wallmount, 9 VDC @ 500 mA
Size —	2.3"H x 8.1"W x 4.3"D (5.8 x 20.6 x 10.9 cm)
Weight —	1.4 lb. (0.6 kg)

2. Introduction

The SCSI Switch II is a SCSI-bus-sharing switch that connects multiple combinations of host and target devices to each other. In situations in which more than one user want to share a SCSI device, the SCSI Switch II eliminates the hazards associated with “hot-swapping” bus cables: Instead of users shutting down a system to plug and unplug cables, the SCSI Switch II switches the SCSI bus between them cleanly and safely. The Switch’s built-in logic monitors bus activity and ensures that data transfer will not be interrupted. Its compact size allows the SCSI Switch II to be set up for many different configurations.

2.1 The Complete Package

You should have received these items with your SCSI Switch II:

- The SCSI Switch II itself,
- The Switch’s AC power supply, and
- This manual.

If you didn’t receive everything, contact your supplier immediately.

The basic SCSI Switch II is ready to install and use in almost any SCSI system with a “single-ended” interface. (The Switch does not support the “differential” interface.) The SCSI adapter cables are necessary to connect the Switch to standard SCSI-1 or SCSI-2 equipment on with telco connectors or high-density 50-pin connectors on the branch buses.

2.2 Description

With the SCSI Switch II, you can switch between one “main” SCSI bus and three “branches.” Both the main bus and the branch buses may have any combination of SCSI initiators (host computers) and targets (disk drives, scanners, tape drives, etc). There is no difference between the main bus and the three branches except for the way they are routed through the Switch:

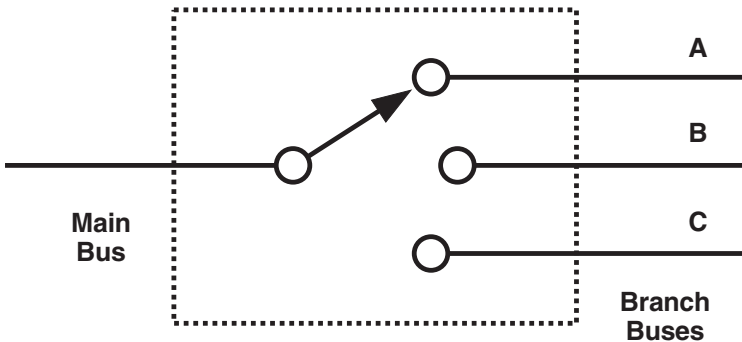


Figure 2-1. Routing of Main Bus and Three Branch Buses.

The SCSI Switch II supports the common “single-ended” SCSI interface.

The main-bus connector on the back of the SCSI Switch II (labeled INPUT) is a female high-density 68-pin receptacle. There are three branch-bus connectors (labeled A, B, and C). Each one is a high-density 68-pin connector.

2.3 Caring for the Switch

The SCSI Switch II is a completely electronic switch. It has been designed for durability and ease of maintenance, but some care should be taken when handling it. Please do not expose the Switch to high humidity or extreme electrical fields. Also, though the Switch can withstand a lot of heat, keeping it away from high temperatures will extend its life.

When you install the SCSI Switch II, as with all computer devices, please take precautions against static electricity. Before handling the Switch, discharge any static electricity you might have accumulated: touch a grounded piece of metal such as a computer cabinet, a metal table, or a power outlet's metal cover plate.

3. Installation

Install the SCSI Switch II as a standalone desktop unit. The Switch gets its power through its external power supply.

3.1 Preinstallation Guidelines

Before you install the SCSI Switch II, make sure that the total length of any of the three possible data paths does not exceed 6 meters (19.7 feet) for 8-bit SCSI-1 and SCSI-2 or 3 meters (9.8 feet) for 16-bit SCSI-2 and SCSI-3. This is the maximum allowed by SCSI specification, and it is fully attainable; though “active” (automatic) switches introduce load on the bus and reduce the maximum length of cable you can run, the SCSI Switch II is a “passive” device and does not subtract from this limit.

When you attach a SCSI adapter cable to the Switch, you must make sure that Pin 1 on the cable’s connector goes to Pin 1 on the Switch’s connector.

3.2 Installing the Switch

To set up the SCSI Switch II on a desktop or otherwise outside of a system cabinet, follow these steps:

1. Find a clear, uncluttered location away from obvious dangers, such as liquids and high temperatures.
2. Attach the main host bus cable to the connector marked “INPUT.” Make sure Pin 1 on the cable connector is aligned with Pin 1 of the Switch connector.
3. Attach the branch bus cables to the respective branch connectors (“A,” “B,” and “C”), using SCSI adapter cables if necessary. Again, make sure Pin 1 on each cable connector is aligned with Pin 1 on the corresponding Switch connector.
4. Plug the input cord of the Switch’s power supply into the power jack on the rear of the Switch, then plug the power supply into a working outlet.

4. Operation

The SCSI Switch II begins operating as soon as it has been connected to a working power source through its power supply; it has no On/Off switch. (The Switch is in no danger if power is removed or goes down, but data may be lost if this happens while the SCSI system is operating.)

The main SCSI bus is always connected to one of the three branch buses. You control which of the branch buses is connected by pressing the pushbuttons (labeled Ports A, B, and C) on the SCSI Switch II's front panel. When you select a new branch, the SCSI Switch II waits to connect to the new branch until it is safe to disconnect from the old branch (data transmission to and from the old branch has stopped).

Once you've plugged in the switch, all of the LEDs will light for one second to signal a successful reset. The LED for the last branch connected will light up. If it blinks rapidly, it's transmitting data. If it stays constantly lit, there is no data currently transmitting.

To switch branches, push the button labeled Port A, Port B, or Port C. If a previous connection is still active (noted by a rapidly flickering port LED), the Switch will flash the LED of the port you selected (approximately once per second) until the bus currently transmitting is inactive for 8 seconds. Then that branch is disconnected, and the branch you selected is connected. The LED next to the branch you selected should be lit, and the LED of the disconnected port should not be lit.

When power is restored to the SCSI Switch II after the power fails or the Switch's power is unplugged, the Switch will connect the main bus to the branch bus last selected. If power is lost during a pending branch change, the previous connection (the one that was still active when power was lost) is not re-established unless you push the button for that branch's position.

5. Troubleshooting

If you encounter a problem when you install or operate the SCSI Switch II, please review this section for likely causes and what to do if you eliminate these possibilities but the problem remains.

5.1 Common Problems

Problem 1. LEDs are not lit:

Check whether the power supply is the one supplied with the SCSI Switch II. You can use a different power supply, but it must have a rating of 9 or 12 volts DC, 1 amp maximum with the positive terminal on the inside of the connector. Also, check whether the power supply is connected to a live power outlet.

Problem 2. Branch-indicator LED flashes constantly:

This is an indication that the main bus and the formerly selected branch bus (the branch corresponding to the number on the front-panel display) are busy with data traffic, but a different branch has been selected (button has been pushed to a new setting). This condition will resolve itself when, after traffic stops for at least eight seconds, the Switch disconnects the formerly selected branch bus and connects the new branch.

Problem 3. SCSI Switch II appears to be working, but SCSI device does not respond properly to system:

If possible, remove the SCSI Switch II. Then, if the device with the problem is on a branch bus, connect that branch directly to the main bus; if the problem device is on the main bus, either terminate the unterminated end of the main bus or connect the main bus to one of the three branch segments. Now try the same type of communication with that device; if the communication succeeds, contact your supplier, because either there's something wrong with your Switch or you've hit a SCSI bug.

If the communication still fails, try these measures:

- Check power to all SCSI devices.
- Check the ID codes of all devices throughout the system and correct any conflicts. On the SCSI bus, no two devices may have the same ID. With the SCSI Switch II in place, you may be connecting two bus segments that have similar ID codes. (To check and reset ID settings on your SCSI devices, please refer to the manuals supplied with those devices.)
- Check your SCSI cables. Make sure that all Pin 1 markers are matched (no cables are connected backwards). Make sure that all cables are in working order. Interchange cable segments to test in other locations as a process of elimination.
- The terminators on that bus segment might be bad. Try swapping in replacements.

5.2 Contacting Your Supplier

If your SCSI Switch II seems to be malfunctioning, *do not attempt to alter or repair the unit*. Call your supplier. The problem may be solvable over the phone.

Before you call, make a record of the history of the problem. Your supplier will be able to provide more efficient and accurate assistance if you have a complete description, including:

- the nature and duration of the problem,
- when the problem occurs,
- the components involved in the problem and their SCSI ID numbers, and
- any particular application that, when used, appears to create the problem or make it worse.

5.3 Shipping and Packaging

If you need to transport or ship your SCSI Switch II:

- Carefully package the Switch. We recommend that you use the original container.
- If you're shipping the Switch for repair, include its power supply. If you're returning the Switch, include both the power supply and this manual. Before you ship, contact your supplier to get a Return Materials Authorization (RMA) number.

6. Technical Details

6.1 Bus Length

The single-ended SCSI interface provides for connections of up to 6 meters (19.7 feet) in length for 8-bit SCSI-1 and SCSI-2 or 3 meters (9.8 feet) for 16-bit SCSI-2 and SCSI-3. This means that no total bus length may be longer than 6 (or 3) meters between the two most distant devices. When you install the Switch, be sure not to create any combination of bus segments longer than the 6- (or 3-) meter maximum.

6.2 Termination

Termination resistor packs (“terminators”) are used to ensure proper signal levels on the SCSI bus, and are essential for its operation. There are two types of terminators, one for the more common “single-ended” interface, another for the “differential” interface. The SCSI Switch II only supports single-ended SCSI.

The first and last devices on a SCSI bus—and *only* those devices—should have terminators installed. Thus, a SCSI bus should have two terminators, one at each end.

The SCSI Switch II acts as a pass-through switch and introduces no unusual termination effects, so when you plan a system with the SCSI Switch II and three branch buses without independently operating SCSI initiators, handle termination as if the SCSI Switch II is simply another connector. If a branch bus won't be operating while it's disconnected from the main bus—it has only target devices, or an initiator that will not transfer data when disconnected—it can be terminated with only one terminator at the far end of the branch. The main bus segment will always be connected to one branch segment, so if you position a terminator at the end of the main bus farthest from the Switch, the main bus will always be properly terminated, because the branch supplies the second termination.

When you check, install, or reposition terminators, please make sure that they are pointed in the right direction, with Pin 1 properly aligned. Also, in order for termination to work properly, there should be a termination-power-source (“TERMPWR”) present. Some SCSI devices have a tiny fuse for the termination-power line, which may be located very close to the termination sockets: If you can see this fuse, TERMPWR should be present. If you can’t see the fuse, however, this doesn’t necessarily mean that TERMPWR is absent. Consult the manual for the SCSI device in question.

6.3 Termination Exceptions

This is the normal termination arrangement with the SCSI Switch II (the wedge shapes represent terminators):

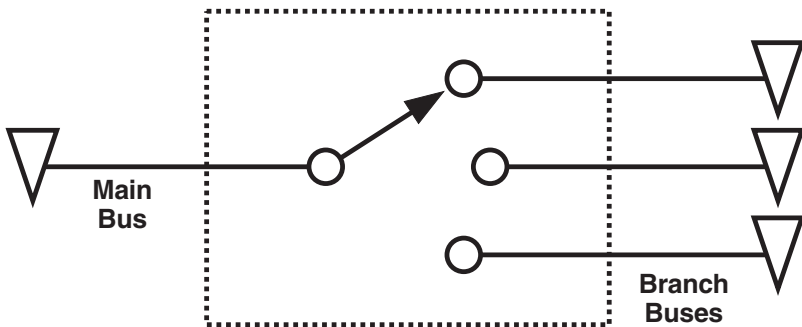


Figure 6-1. Normal Termination.

An exception to the illustration above is the case where a branch bus may have local data traffic even while it’s disconnected from the main bus—if the branch has, for example, both a computer and a disk drive, and the computer can operate the drive even when the main SCSI bus isn’t switched to that branch.

Normally, termination should be placed at the two very ends of a SCSI bus. For a SCSI Switch II system, this means one terminator at the end of the main bus and one at the end of each branch bus. But if an unselected branch bus can operate on its own, then it must have termination at both of its ends. So imagine that we dutifully add a terminator to the near end of such a segment

to match the one on the far end. The only problem with this scenario is that when you select that branch and the Switch links it to the singly terminated main bus, the total number of terminators on the bus rises to three. This violates SCSI rules and has little chance of working properly.

In such cases, special care should be taken to manage the bus configuration. Termination should always be placed near the ends of the overall SCSI bus. However, where a branch may have data traffic while disconnected from the main bus, termination may be moved slightly to accommodate the situation:

First, shorten the main bus so that it's no longer than a few centimeters (two or three inches). Then replace the termination normally found at the end of the main bus with terminators the top of each branch, no farther than another few centimeters (another two or three inches) from the SCSI Switch II:

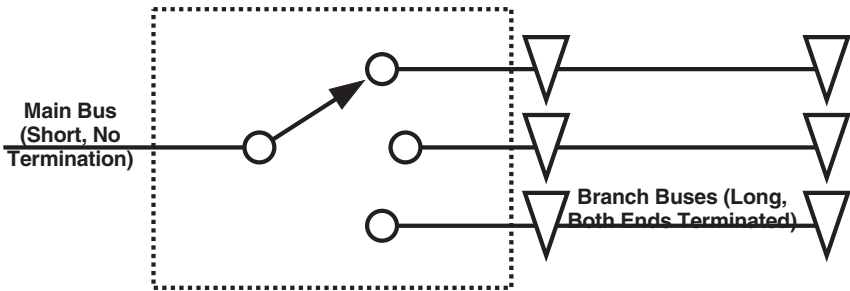


Figure 6-2. Alternate Termination.

As long as the main bus is short enough, and as long as the main bus has only one or possibly two devices, these devices will be close enough to the branch-top termination and the bus will probably operate correctly. However, please note that such a configuration is still in violation of SCSI rules. This is also not the intended use of the SCSI Switch II. The Switch is designed to support “dead” branches only, in conformance with the nature of the SCSI bus.

If termination is not properly configured, you may experience unpredictable behavior or loss of data. For more information, please see the documentation for your particular SCSI devices.