BLACK BOX
NETWORK SERVICES

Tone Operated Power Switch+ (TOPS+) (Master and Remote Units)
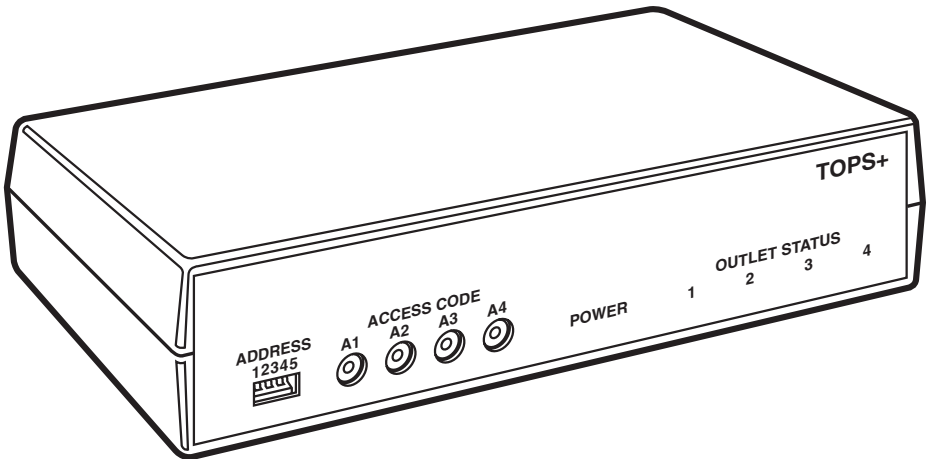
FEDERAL COMMUNICATIONS COMMISSION
AND
INDUSTRY CANADA
RADIO FREQUENCY INTERFERENCE STATEMENTS

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.

Requirements That Must Be Met When the TOPS+ Is Operated

A. The User's Responsibilities

If the telephone company asks you, you must inform them of the connection of the TOPS+ to, or disconnection of the TOPS+ from, the telephone line. (If the proper jacks for making the connection are not available, you must order the type of jack to be used from the phone company.) The following information must also be given to the phone company if they request it:

Manufacturer: Market Central, Inc.
Model Number: TOPS+ 1 Receptacle (SWI065A) or
 TOPS+ 4 Receptacle (SWI066A)
FCC Registration Number: 2F8USA-25801-OT-N
Ringer Equivalency: 0.8 B
Jacks which may be used: USOC RJ-11C

FCC approval to attach the TOPS+ to the telephone network has been obtained. The FCC Part 68 label on the bottom of the TOPS+ must remain attached to the unit.

It is illegal to connect the TOPS+ to any pay-telephone or party line.

B. The Telephone Company's Rights and Responsibilities

If your TOPS+ causes harm to the telephone network, the phone company may discontinue your service temporarily. If possible, they will notify you of this in advance, but if advance notice is not practical, they will notify you as soon as possible. They will give you the opportunity to correct the problem that led to the discontinuance. They will inform you of your right to file a complaint with the FCC concerning the discontinuance.

The phone company may make changes to its facilities, equipment, operations, or procedures which could affect the operation of your TOPS+. If they do, you will be given adequate notice, in writing, to give you an opportunity to maintain uninterrupted service.

C. Repairing Faulty Equipment

If you have trouble with your TOPS+, call Black Box. The phone company may ask that you disconnect the unit from the network until the problem has been corrected or until you are sure that the TOPS+ is not malfunctioning.

If you and the supplier determine that the TOPS+ is faulty, it should be returned for repair, in its original packaging, if possible. (Do not attempt to repair the unit yourself, as this will violate FCC rules and might cause danger to people or to the telephone network.)

D. Direct-Connect Requirements

The TOPS+ unit is an FCC-registered device which directly connects to DDD (Direct Distance Dial) networks in the United States of America. In addition to all safety requirements set by FCC Part 68, there are various connection arrangements provided by the telephone company to ensure that the signal level received at the telephone company's central office does not exceed -12 dBm.

Some of the connection arrangements that the phone company provides are standard modular data jacks. These jacks allow you to connect and disconnect the TOPS+ from a DDD network without interfering with the operation of other equipment connected to the network. Different types of data jacks are identified by different Universal Service Order Code (USOC) designations, so you must specify which one you want when ordering them.

The TOPS+ is designed to use the RJ-11C data jacks which establish the "permissive" connection type. These jacks provide bridged connections to the tip and ring of a telephone line.

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 connectado 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 fisica 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 lineas de energia.

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 objectos liquidos 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: Objectos 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.

TRADEMARKS

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CONTENTS

1. Specifications

Approvals — FCC Part 15 (Class A) and Part 68 (Registration No. 2F8USA-25801-OT-N); UL; CSA

Ringer Equivalency — 0.8 B

Relay Contacts — Rated at 250 VAC, 8 A

Maximum Load — 15 A maximum (total) switched load

Controls — Front-panel: (4) 10-position rotary switches to set access code, (1) 5-position DIP switch

Indicators — Front-panel LEDs: (2) for SWI065A-R2, (5) for SWI066A-R2: (1) Power, (1) for each port

Connectors — Rear-panel: (1) 2-position terminal block, (2) RJ-11 female (line and phone), (1) DC power jack, (1) NEMA 5-15R power outlet for each port

Leads Supported — AC Hot switched, AC Neutral and Ground not switched

Power — From UL® and CSA-approved wallmount power supply: Optimal input: 115 VAC, 60 Hz; Output: 9 VDC @ 0.5 A

Operating Temperature — 32 to 158˚F (0 to 70˚C)

Storage Temperature — 14 to 230˚F (-10 to 110˚C)

Enclosure — High-impact plastic

Size — 2.3"H x 9"W x 6"D (5.8 x 22.9 x 15.2 cm)

Weight — 1.4 lb. (0.6 kg), including power supply

2. Introduction

The Tone Operated Power Switch+ (TOPS+) is a remotely activated switching device that lets you or other authorized people call a site from any touchtone (DTMF) phone and turn devices at that site ON or OFF (see **Figure 2-1**). TOPS+ answers on the third ring, then greets callers with a request to enter a 4-digit access code. When the correct code has been entered, TOPS+ will act as a relay, permitting or interrupting the flow of power from an AC wall outlet to the device(s), depending on the tones that a caller enters.

You can connect up to 15 remote TOPS+ units to the TOPS+ master unit (the master unit is the one connected to the phone line). The master unit can report the status of each unit and pass commands to control each unit's relays.

The TOPS+ comes in four versions: a master unit with an outlet for one device (SWI065A-R2), a remote unit with an outlet for one device (SWI064A-S), a master unit with outlets for four devices (SWI066A-R2), and a remote unit with outlets for four devices (SWI067A-S). The four-outlet versions will switch all four devices ON or OFF independently.
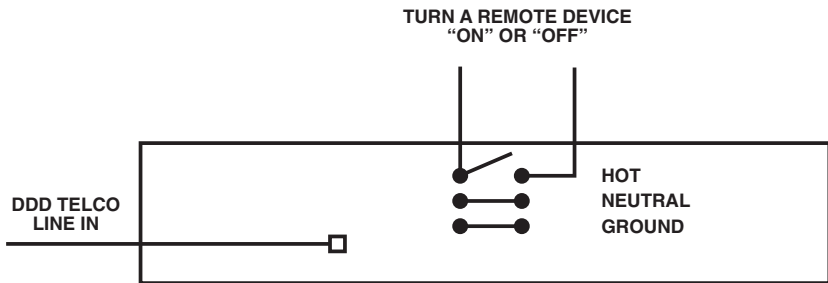

Figure 2-1. Typical TOPS+ Application.

TOPS+ switches your remote device on or off at a command from a touchtone handset.

3. Installation

To install your TOPS+, you'll need a small flat-head or Phillips screwdriver. Follow these steps:

1. Set your access code by using the screwdriver to rotate the four dials (rotary switches) marked "A1" through "A4," beneath the words "ACCESS CODE" on the front of the case. Each dial has a small arrow printed on it and is surrounded by the digits 0 through 9. Your TOPS+ recognizes the digit that the arrow points to as the code digit. The leftmost dial (A1) governs the leftmost digit of your access code, the dial next to it (A2) governs the second digit, and so on.

2. Connect the RJ-11 jack marked LINE on the rear panel of the TOPS+ to the site's appropriate modular phone jack with a standard male-to-male RJ-11 cable. If desired, connect a phone or other device to the same line via the RJ-11 jack marked PHONE.

NOTE

The other device must answer before the TOPS+. (The TOPS+ answers after the third ring.)

3. Plug the device(s) that you want to be able to remotely turn ON and OFF into the outlet(s) on the rear of the TOPS+. Make a note of which outlet you plug each device into, since you will need to know that to turn each device ON or OFF with remote touch-tone codes.

4. If you want to control more than one TOPS+ unit with one phone line, connect the additional TOPS+ remote units (up to 15 of them) to the master TOPS+ unit. Use twisted-pair cable connected to the 2-screw terminal block on the TOPS+ units. Use the five-position DIP switch to set the unit address of remote units. Terminate only the end units via position 5 on this DIP switch.

5. The TOPS+ is powered separately from the devices that it switches. It gets the power that it needs to drive its relays, etc., through a detachable power supply. For this step, plug the end of the power supply's line cord into the matching jack on the rear of the TOPS+. Don't plug in the power supply's transformer yet.

6. The TOPS+ gets the power that it supplies at its outlet(s) through an attached 6-ft. (1.8-m) line cord. Plug this line cord into an AC outlet.

7. Recheck the connections you have made in Steps 2 through 6. If they are all tight, plug the power supply's wallmount transformer into an AC outlet. The TOPS+ red front-panel power LED, marked "POWER," should light.

8. Refer to **Table 3-1** and set the address on the master and remote TOPS+ units via DIP Switch S1.

Table 3-1. DIP Switch S1 Settings (UP is OFF, DOWN is ON).

Switch Position	1	2	3	4	5
Unit Address (see NOTE 1, below)					
0	ON	ON	ON	ON	
1	OFF	ON	ON	ON	
2	ON	OFF	ON	ON	
3	OFF	OFF	ON	ON	
4	ON	ON	OFF	ON	
5	OFF	ON	OFF	ON	
6	ON	OFF	OFF	ON	
7	OFF	OFF	OFF	ON	
8	ON	ON	ON	OFF	
9	OFF	ON	ON	OFF	
10	ON	OFF	ON	OFF	
11	OFF	OFF	ON	OFF	
12	ON	ON	OFF	OFF	
13	OFF	ON	OFF	OFF	
14	ON	OFF	OFF	OFF	
15	OFF	OFF	OFF	OFF	
Expansion Port (see NOTE 2, below)					
Unterminated					OFF
Terminated					ON

NOTES

[1]Switch S1, positions 1 through 4 are used to set the unit address of TOPS+ remote units. The address of the TOPS+ master unit is always zero. Switch S1, positions 1 through 4 on the master unit are not used.

[2]Terminate only the end TOPS+ units. For example, if you are connecting four units, terminate only the two end units, not the two internal units. The master TOPS+ has built-in failsafe bias resistors to provide proper bias on the two-wire interface when no unit is driving the line.

TOPS+ is now ready for operation.

4. Operation

4.1 Remote Switching

Your TOPS+ will set its relays as instructed by any caller who accesses it properly. To switch the TOPS+, an authorized person should follow these steps:

1. Call the TOPS+ from any touchtone phone. The unit will answer after the third ring and speak the words "ENTER YOUR ACCESS CODE."

2. Enter the access code (the four digits that have been set on the dials on the front of the TOPS+) by pressing the appropriate number keys on the touchtone keypad.

3. If a caller hangs up without entering an access code, or enters an incorrect access code three times in a row, the TOPS+ disconnects immediately. After the caller hangs up, the phone line current will be interrupted for about 850 milliseconds. If a caller doesn't enter an access code but doesn't hang up either, the TOPS+ disconnects after waiting 30 seconds.

NOTE

The access code of the TOPS+ cannot be changed remotely, over the phone. It can only be changed by resetting the four dials on the front panel of the unit as explained in Chapter 3**.**

4. If you entered the correct code, the master TOPS+ will report the position of its relays. You can obtain the status of the relays on other units by entering the proper code.

4.2 Controlling the TOPS+ Unit

Table 4-1 lists the codes that control the TOPS+ unit. The caller can check the status of the master and all other TOPS+ units, and can change the state of any relay on any unit. If the caller enters a command not listed in **Table 4-1**, the TOPS+ will respond "Invalid Command."

Table 4-1. TOPS+ Commands.

Code	Function
#xx	Report status of unit "xx"
	xx=unit address 00 to 15 (00 is master unit)
xxys	unit "xx" outlet "y" state "s"
	xx=unit address 00 to 15 (00 is master unit)
	y=outlet number 1 to 4 (y=0 controls all outlets)
	s=desired state (0=OFF, 1=ON)
*	Hang Up

Table 4-2. Caller ID Commands.

Code	Function
#40	Enter Master Caller ID Number (10 digits)
#41	Report Master Caller ID Number
#42	Enable Caller ID Screening
#43	Disable Caller ID Screening
#5x	Enter Caller ID Number x (10 digits).
	x=number of the Caller ID number being entered (0-9).
	Caller ID number 0 is the Master Caller ID number.
	The TOPS+ will accept ten Caller ID numbers.
#6x	Report Caller ID Number x
	x=number of the caller ID number being verified (0-9).
	Caller ID number 0 is the Master Caller ID number.

Once you enter a valid command, the TOPS+ will perform the requested command. After the TOPS+ has completed the command, it will respond with the appropriate message for that command. While the TOPS+ is executing a command, DTMF tones will be ignored. Once the command is complete and the message has started, the TOPS+ will accept new DTMF commands. If a DTMF tone is detected during the response message, the message is stopped, and the new command is received. If you have entered part of a command, and wish to cancel it, press the # key to terminate the partial command. The TOPS+ unit will respond "Invalid Command," then wait for the next command.

NOTE

When the master TOPS+ unit receives a command for a remote TOPS+ unit, it will wait for up to two seconds for the remote unit to respond. If the remote unit does not respond, the master unit will respond "UNIT XX OFF."

4.3 LEDs

TOPS+ is equipped with two (SWI065A-R2) or five (SWI066A-R2) red LEDs on its front panel. The TOPS+ will light its Power ("PWR") LED when it's plugged in; this LED will remain on as long as the TOPS+ is powered. The single-outlet TOPS+ has one LED, marked "1," beneath the words "OUTPUT STATUS" on its front panel; this LED lights when power to its outlet is on. The four-outlet model has four LEDs marked "1" through "4" under "OUTPUT STATUS"; each LED will light when the corresponding outlet is powered.

5. Troubleshooting

5.1 Suggestions for Some Common Problems

If your TOPS+ doesn't seem to be getting power (the device[s] plugged into it won't come on and its "PWR" LED is dark), check the connections at both ends of its power supply (both where the cord plugs into the unit and where the transformer plugs into the wall). If these connections are all right, plug another device into the same outlet to make sure the outlet is delivering power. If the outlet is delivering power and all the connections are good, call Black Box Technical Support at 724-746-5500.

If your TOPS+ is getting power (the "PWR" LED is lit) but the device(s) plugged into it won't come on, check the outlet(s) of the TOPS+. If all devices are firmly plugged in, check to make sure they haven't been turned off. If they are plugged in and turned on properly, call technical support.

If your TOPS+ doesn't answer when you try to reach it by phone, check the connections at both ends of its phone cable. If these connections are solid, call technical support.

If the TOPS+ answers your call, but when you try to access one of the remote units, the TOPS+ says "UNIT XX OFF," check the address on the remote unit. No two remote units should have the same address. Check the connections to all remote units.

If the TOPS+ does not respond to the touch-tone command, the problem could be: Although the TOPS+ will accept commands during the response message, occasionally, the frequency and volume of the voice message may cancel out the DTMF tone. If this happens, the TOPS+ will not stop the response message, when the first DTMF tone is sent. This means that the TOPS+ has not successfully received the first DTMF tone. Try holding the first key longer, and listen for the TOPS+ message to stop before pressing the second key. If you have entered the complete command, and get no response, the TOPS+ has likely missed the first character of the command. Press the # key to terminate the command.

5.2 Calling Black Box Technical Support

If your TOPS+ seems to be malfunctioning, *do not attempt to alter or repair the unit.* Not only is this unlikely to be successful, but since it constitutes an unauthorized alteration of an FCC-registered device, it is also illegal. Contact Black Box Technical Support instead.

Before you do, make a record of the history of the problem. Black Box 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.

- 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 TOPS+:

- Carefully package it. We recommend that you use the original container.

- If you are shipping the TOPS+ for repair, make sure you include its power supply. If you are returning your TOPS+, include both the power supply and this manual. Before you ship, contact Black Box to get a Return Materials Authorization (RMA) number.