FreeSwitch Instruction Manual
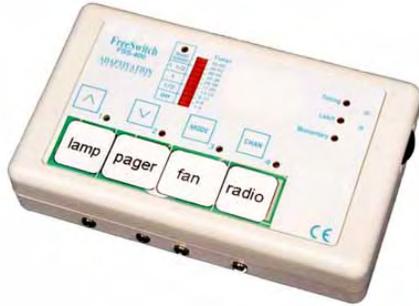
Introduction

Congratulations on purchasing the FreeSwitch environmental control unit by Adaptivation. With your new Adaptivation FreeSwitch™ environmental control system, you can remotely operate most AC or battery* powered devices using the on-board keypad or adaptive switch. The FreeSwitch uses Powerhouse X-10™ or X-10 compatible appliance modules (e.g. Radio Shack Appliance Modules). Press one of the on-board keypad buttons or plug an adaptive switch into one of the FreeSwitch inputs then touch the switch and the corresponding AC or battery* powered device will activate. The FreeSwitch will operate up to four AC or battery powered* appliances with direct selection. All four channels are independently capable of activating in any of the following four modes.

Momentary selection : The appliance activates for as long as the input button is depressed.

Latched selection : Press once and the appliance turns on. Press again and it turns off

Timed seconds : Press once and the appliance turns on then automatically turns off anywhere from 1 to 60 seconds later.

Timed minutes : Press once and the appliance turns on then automatically turns off anywhere from 1 to 60 minutes later.

Because the FreeSwitch is wireless, you are not tied down by cords or limited to a particular area in the room. The range of the FreeSwitch will vary depending on the environment, however, typical range will be around 75 feet in a school or institutional setting and 100 feet in a home setting. With wireless activation there is no need to have

120 volt electrical cords near the operator. Mobility is not an issue when using the FreeSwitch to activate AC appliances.

* Battery operated devices can be activated using Adaptivation's battery powered wireless receiver or with X-10 Universal Module. (see catalog) Contact Adaptivation for more information.

# Theory of Operation

This document contains useful information on the operation of your FreeSwitch. Reading it will help speed you on your way to an enjoyable and successful use of your FreeSwitch.

Background

How it Works

The FreeSwitch activates AC appliances via Powerhouse X-10 modules (Also known as Lamp Modules and Appliance Modules at Radio Shack). Diagram 1 helps illustrate a typical scenario.
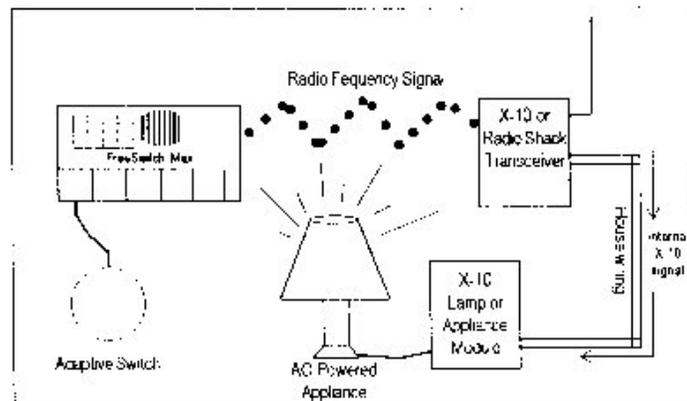
Diagram 1 FreeSwitch Setup.

Diagram 1. FreeSwitch Setup.

1) The FreeSwitch is activated by pressing one of the keypad buttons or an external adaptive switch.
2) The FreeSwitch in turn sends a radio frequency (RF) signal to an X-10 or Radio Shack transceiver module (included with your FreeSwitch).

3) The transceiver module sends another signal over the house or building wiring which is picked up by any and all X-10 or Radio Shack receiver modules plugged into the wall sockets, however, only those modules set to the same House code as the FreeSwitch (including the transceiver module) and corresponding to the button pressed on the FreeSwitch will activate.
4) When the receiver module activates, the AC appliance plugged into it turns on.

Each FreeSwitch is set to a unique House code (A through P). Each FreeSwitch transmits to its own transceiver module, also set to the same House code. This way multiple FreeSwitches may be placed in a given area, each capable of activating their own set of eight devices without interferring with the others. Each appliance plugs into its own receiver module set to the same House code as the FreeSwitch and its transceiver module. Receiver modules also have a rotary dial to set the Unit code (also refered to as channel code or channel number). There are 16 possible Unit codes on each receiver module labeled 1 through 16. The FreeSwitch only uses the first four corresponding to channels one (1) through four (4).

Terminology

Unit Code vs. Channel
Powerhouse X-10 and Radio Shack receiver modules have dials labeled House Code & Unit Code. Adaptivation uses the the term House Code but it uses Channel Code or Channel Number interchangebly with Unit Code. Note that House Code uses A through P, whereas Channel Number uses 1 through 4.

RF
RF stands for radio frequency. RF devices can transmit through walls unlike infrared (IR) which requires line of sight. IR transmitters (e.g. TV, VCR and stereo remote controls) generally must be pointed at the device they are controlling and operate up to 20 ft. away. RF devices do not need to be pointed at the device they are controlling and can transmit up to dozens, even hundreds of feet, however, they are subject to electromagnetic interference and their perfomance can be affected by their surrounding environment.

LED
LEDs (light emitting diode) are the small red lights on the FreeSwitch.

AC
AC means alternating current. It refers to 120 volt, 60 hz devices that plug into a wall socket to operate (e.g. lamps, blenders, TVs, radios, stereos, etc.)

Features

• **Independently activate up to four AC or battery powered appliances with direct selection all at the same time.**

• **On-board keypad for direct selection. Templates can be made using Boardmaker from Mayer-Johnson.**

• **External jacks for direct selection using adaptive switches.***

• **All four channels are independently capable of momentary, latching, timed seconds or timed minutes activation.**

• **Easy to read LED bar graph lets you know exactly what the timer is set to for each channel using timing activation. NO   GUESSING.**

• **Up to 16 FreeSwitch units can be used in an area at the same time, each capable of operating its own four devices.**

• **Delayed activation with choice of four delay lengths.**

• **Wireless (radio frequency) operation using a battery powered transmitter optimizes safety.**

• **Up to 100 foot range indoors.**

• **Durable design resists damage due to dropping, throwing and other rough usage.**

• **Compatible with Powerhouse X-10 or Radio Shack Appliance Modules.**

• **Compatible with Adaptivation's wireless receiver for operating battery powered devices.**

• **6 month battery (alkaline) life with normal use**

• **Operates on one easy to replace 9 volt battery (not included).**

Face Panel Description

Diagram 2. FreeSwitch Keypad and LED description.
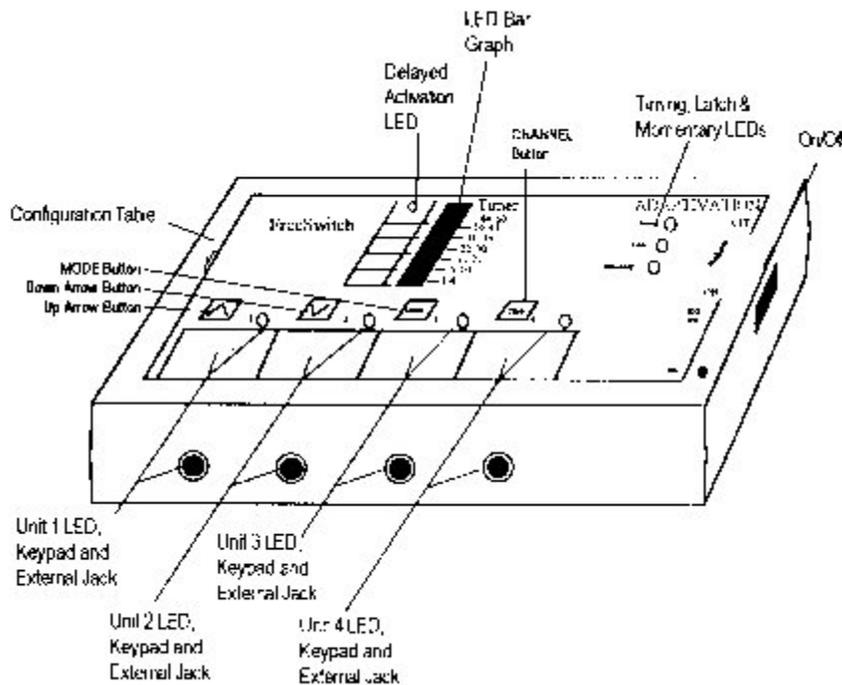
Diagram 2 shows the FreeSwitch face panel with each of the major features identified.

Configuration Table

   The Configuration Table is used to show the settings of the various features (e.g. delayed activation, mode, etc.). When an LED on the top of the Configuration Table is illuminated (e.g. Delayed activation), a portion of the LED bar graph will also be illuminated indicating the setting of that feature. Follow the illuminated LEDs on the bar graph over to the appropriate column to observe the setting of the corresponding feature. For example, if the delayed activation LED is illuminated and the bottom two LEDs of the bar graph are illuminated, then delayed activation is off. If the top two LEDs on the bar graph are lit, then delayed activation is set to 1 1/2 seconds.

Delayed Activation (see page 10)
   Typically when a keypad or external button is pressed, the corresponding channel on the FreeSwitch activates immediately. A ½, 1, or 1 ½ second delay can be added. This means that the keypad or external button must be held down for the delay period before the channel activates. Delayed activation is helpful if a person drags his or her hand across the keypad before reaching the button of choice. A channel will activate only if the person's finger stays on the button for the delay period.

LED Bar Graph
   The LED bar graph is composed of 10 individual LEDs indicating the settings of the various features in the configuration table The LED bar graph also shows the timer setting for each channel (or unit) set to timer mode.

CHAN Button (see page 9)
   The CHAN (short for channel) button is used to cycle through the 4 channels and the Configuration Table for the purpose of programming the FreeSwitch. The CHAN button itself does not cause an appliance to activate. Repetitively pressing the CHAN button sequentially selects channel 1, then channel 2, then channel 3 and so on up to channel 4 as indicated by the corresponding LED illuminating. The MODE button places the selected channel in TIMING, LATCHING, DIRECT or OFF mode. When DELAY ACTIVATION is selected the Ù button is used to choose 0, ½, 1 or 1½ second delayed activation.
   The UP ARROW (Ù) button increases the timer value when using a channel in timer mode. The DOWN ARROW (Ú) decreases the timer value in timer mode.

LED Indicators

Pressing the CHAN or the MODE button activates the LEDs. There are four LEDs for channels 1 through 4. When a channel LED is lit, the corresponding channel can be changed. There are three mode LEDs corresponding to direct, latch and timer that indicate what mode the active channel is in. When the Delay Activation LED is lit, the delayed activation feature can be set. The DELAYED ACTIVATION LED flashes whenever the FreeSwitch is transmitting.

Installation Instructions

1. Set the FreeSwitch and the X-10 transceiver Housecode dial to the same letter. The FreeSwitch's Housecode dial is inside the battery compartment. Point the red side of the indicator to the same letter as the X-10 transceiver unit. If you will be using other X-10 modules set their Housecode dials to the same letter as the rest of your system.

2. Channels 1 through 4 on the FreeSwitch correspond to Unit codes 1 through 4 on additional X-10 modules.

3. Insert a 9 volt battery (not included) into the battery compartment.

4. Plug an AC appliance into the Transceiver Module and check that the power switch on the appliance is on. Plug the Transceiver Module into an unswitched AC or Mains outlet. The Transceiver Module is limited to 500 watts.

5. Plug additional X-10 modules into the wall outlet and set them to the same Housecode as your FreeSwitch and Transceiver Module. Set the Unit code to channel 1 through 4 corresponding to the channels on the FreeSwitch.

Please adhere to the power ratings listed on the back of each X-10 module.

Powering up:

When the battery is installed, the FreeSwitch is configured as follows:

Channel 1: Momentary
Channel 2: Momentary
Channel 3: Latch Mode
Channel 4: Timing mode

Removing the battery for more than about 10 seconds will cause the channel settings to revert to these factory settings.

Operation

1) Turn the ON/OFF knob to the on position.

2) Press the on-board keypad or plug an external switch with a 1/8" plug into an INPUT jack.

3) If you wish to change any of the channel settings, press the CHAN or MODE button to activate the LEDs, placing the FreeSwitch in Program mode.

   Repetitively press the CHAN button until the channel you want is selected. Then, repetitively press the MODE button until the mode you want is selected. If using Timer mode, repetitively press the Ù or Ú button to select the desired timer value. See the section "Setting the Timer" for more information.

   Press the on-board keypad or input switch to take the FreeSwitch out of Program mode as indicated by the LEDs turning off. You can also wait for 4 seconds and the FreeSwitch will automatically return to normal operation

4) Press the on-board keypad or adaptive switch and the corresponding X-10 module will activate, turning your appliance on.

Mode Settings

OFF: If a channel is set to off it will not activate either directly or in scanning selection.

MOM: (momentary) The appliance will remain on for as long as you are touching the input switch. In scanning selection, the appliance will pulse on then off. The X-10 Chime Module is best used with the FreeSwitch in Direct or Timing mode.

LATCH: Touch the input switch once and the appliance turns on. Touch it again and it turns off.

TIMING: Touch the input switch and the appliance turns on for a predetermined amount of time. When the timer "times out" the appliance turns off. The timer will 'time out' even if the operator constantly presses the input switch.

Setting the Timer

   There are 10 LEDs on the Timer bar graph, however, there are 30 possible timer settings. Starting at 1 second, the timer advances one second with each press of the Ù button, up to 20 seconds. For example, if the time is on 1 second, press the Ù button once. Now the timer is on 2 seconds. Press it 3 more times and the timer is now on 5 seconds as indicated by the two LEDs illuminating.

   After 20 seconds, the timer advances four seconds with each press of the Ù button. If the LED bar graph is lit up to the 24 second mark, press it once and the timer is now on 28 seconds. Press it again and the timer is set to 32 seconds as indicated by the next LED bar illuminating.

To set the timer in minutes instead of seconds, continue pressing the Ù button until the TIMING LED and CHANNEL LED flash. When these are flashing timing is set in minutes.

The timer valuedecreases when the Ú button is pressed.

Delayed Activation

Delayed activation requires that you hold your hand on the input switch for ½, 1 or 1½ seconds before an appliance activates. It works with both direct selection. If you create an external switch array and the operator drags his or her hand across the switches, the appliance corresponding to the first switch touched will activate. By using Delayed Activation, an appliance will be activated only if the operator's hand holds still on a switch.

Considerations - Please Read

• **If you are using more than one transceiver unit in the same area they should be placed at least 5 ft. apart.   If the transceivers are too close together, they may interfere with each other causing unpredictable behavior. This is true with transceiver units only. Other X-10 modules can be placed as close to each other as you wish.**

• The FreeSwitch transmits one channel at a time so if you touch two or more input switches simultaneously, it may not know which channel you want. One channel may activate or neither may activate depending on which channels you are trying to activate.

• The FreeSwitch does not need to be in the line-of-sight with the transceiver, such as with a TV remote control. It works well around most objects and corners, however, try to keep the transmitter out in the open. Do not "hide" the transceiver unit behind a desk or file cabinet. Other X-10 modules can be placed essentially anywhere since they receive their signal through the power lines.

• X-10 modules typically work well throughout a house. However, the signal from the transceiver can't always cross from one circuit in a house or building to another circuit. This is especially applicable in an institutional setting such as a school or hospital. In other words, the FreeSwitch probably can't activate an appliance on the opposite side of a building. Consult X-10, Inc., 91 Ruchman Rd., Box 420, Closter, NJ 07624-0420, Adaptivation, or your local X-10 dealer for assistance.

TROUBLE SHOOTING

If the appliance is not activating when you touch the input switch check the following • Be sure the 9 volt battery is fresh and properly installed

• Make sure the Housecode setting on the transceiver and any other X-10 modules are the same as the FreeSwitch.

• Make sure the Unit setting on the X-10 module is the same as the channel on the FreeSwitch you are trying to use.

• Make sure the FreeSwitch and transceiver modules are not "surrounded" or blocked by metal. For example, plugging a transceiver module into the wall then pushing a metal desk up to it may block the signal from entering the module.

• If you are using more than one FreeSwitch at a time, make sure the corresponding transceiver modules are sufficiently separated.

• Make sure the power switch on your AC appliance is on.

• Some channels work better than others in Direct mode and Timing mode set to 1 second. Try different combinations of channels and modes to optimize performance.

• Is the channel you are using turned off? See "Operation" section, Page 4.

• The X-10 Module may be on a different house wiring circuit. See X-10 technical support or call Adaptivation.