

Voice Switch Manual



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Voice Switch

DESCRIPTION OF FUNCTION



The Voice Switch is designed to provide a switch closure in response to a sound that meets user-defined criteria. The Voice Switch has two primary applications. The **first** is to provide a switch closure to control technology in response to sound production. For example, an individual who can produce a sound such as smacking their lips or tongue, a vocalization or humming, or saying a word, can control an electronic device such as an augmentative and alternative communication device, environmental control, toy, computer game, or a relay device that enables the control of an attached electronic appliance such as a blender, radio, or light.

In the "all sounds" mode any sound of sufficient loudness and duration (both of which are adjustable) will produce a switch closure. In the "voice only" mode, the switch will only activate when sound is produced by a human larynx (voice box) that is of sufficient loudness or duration.

The **second** application is to train sound production capability by persons with speech disabilities. It is expected that this device will be used by persons who have limited ability to produce sounds with the larynx or voice box because of cerebral palsy, traumatic brain injury, brainstem stroke, or nerve damage due to injury or surgery. The voice loudness and duration (length of sound) required to activate the Voice Switch can be

specified using the controls on the front panel. In this way, requirements to produce switch closure can be adjusted to meet performance expectations of the individual. For example, early in recovery, sounds of limited loudness and duration would activate the voice switch to provide feedback to the individual. As recovery continues, the loudness and/or duration requirement to achieve switch closure can be adjusted to support intervention goals.




EQUIPMENT


The Voice Switch comes standard with two AA batteries and two cables (one black, one gray) terminated with 1/8-inch mono plugs for interfacing to assistive devices. In addition to this standard equipment, a microphone headset is required. Two different types of microphone can be used. The universal headsets available for use with cell phones are compatible with the Voice Switch and work well for detecting airborne sounds. A neck (or throat) contact microphone can be used to detect sound produced at the level of the larynx or voice box. This throat microphone is virtually immune to environmental sounds because the sensor contacts the throat. Contact your distributor or InvoTek for more information on throat microphones.





GETTING STARTED

Front Panel Description

 Only-Voice/Off/Any-Sound Switch. This three-position switch turns the Voice Switch on and off. When the switch slide is moved toward the any sound position , the Voice Switch will accept any sound as a valid input. The center position turns off the Voice Switch. When the switch slide is moved toward the only voice position , the Voice Switch will only accept voiced sounds as a valid input.

 Speaker Loudness Control. Adjusting the associated knob to a higher number increases the amount of sound that the user must produce to have the switch “hear” him or her.

 Audio Feedback Control. Adjusting the associated knob to a higher number increases the volume of the sound into the earpiece.

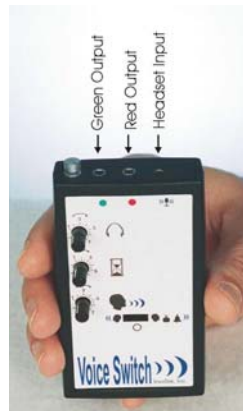
 Sound Duration Control. Adjusting the associated knob to a higher number increases the required time in seconds that a sound must be held before the green output can be activated (see below).

Setting the Sound Duration Control to zero (turn the knob to the counterclockwise stop) activates a special mode.

The green output is activated immediately upon detecting an appropriate sound and is held closed until the sound stops. This mode can be used with head tracking systems (such as NaturalPoint's SmartNav EG system) to perform click-and-drag computer cursor control operations. A short sound will generate a mouse click, while a long sound that occurs while the cursor is being moved (via the head-tracking equipment) will cause a "click and drag" operation.

When the Sound Duration Control is set to a longer time than zero the red switch output or the green switch output is closed for a very short time ($1/10$ of a second) once a sound stops. The Voice Switch determines which switch to close based on the status of the LED and the Sound Duration Control. If the sound is stopped before the duration control is satisfied and while the red LED is illuminated, the red switch closes. If the sound is produced longer than the set duration time and the green LED illuminates, the green output will activate when the sound is stopped.

- Green Switch Output. Connecting a cable with $1/8$ -inch mono plugs into the top panel jack aligned with the green dot enables the Voice Switch to send a switch output to another device. This switch output is only activated when the feedback LED is illuminated green.



- Red Switch Output. Connecting a cable with $1/8$ -inch mono plugs into the top panel jack aligned with the red dot enables the Voice Switch to send a switch output to another device. This switch output is only activated when the feedback LED is illuminated red.



- Headset Input. A microphone headset is connected to the top panel jack aligned with this icon. Either a universal cell phone headset or a throat microphone with earpiece is required.

Features

Visual Feedback to User. A bicolor LED indicates when a valid sound is heard. If the Sound Duration Control is set above “zero”, the LED will first turn red to indicate that a valid sound is present, and then when the duration control is satisfied will switch to green.

Audio Feedback to the User. A low-frequency tone is generated to the earpiece immediately when a valid sound is heard. A second high-frequency tone is generated when the duration control is satisfied. Audio from the person speaking is also provided. A tone is also generated when the Voice Switch is turned on.

Power On Feedback. The Voice Switch will generate a short simultaneous red/green (yellow) LED blink when power is turned on. If the Voice Switch does not detect any sound, the LED will produce a green blink once every six seconds to remind the user that power is on and the batteries are in good working order. If the LED blinks red instead, the batteries are weak and should be replaced or recharged. The same blink pattern (green for good batteries, red for weak batteries) will also occur after the Voice Switch has not heard a sound for three minutes, providing feedback to the user that the Voice Switch is still powered. If at any time the LED blinks alternately red and green in a quick repeating pattern, it means that the batteries must be replaced or charged before the switch can be used reliably. If the Voice Switch is turned on and the LED does *not* blink yellow, the batteries need to be replaced or charged.

APPLICATION QUESTIONS

1. How do I get the fastest possible switch closure after any sound is produced?

- Insert one 1/8-inch plug from a provided cable into the Green Switch Output ● and connect the other end to the AAC, assistive technology, or latching device.
- Set the Off/On switch to All Sounds 🗣️🔊🔊🔊 .
- Turn the Sound Duration Control as far to the left as possible (shortest duration = 0). Adjust the Speaker Loudness Control so that the person speaking can easily activate the Voice Switch.

2. How do I get a right and left switch closure to control PC computer programs?

- Plug the adapted mouse (one source is InfoGrip) into the computer and set the Voice Switch to All or Voice Only.
- Insert one 1/8-inch plug from a provided black cable into the Red Switch Output ● on the Voice Switch and connect the other end of the cable into the jack on the adapted mouse associated with the left mouse click.
- Insert one 1/8-inch plug from a provided gray cable into the Green Switch Output ● on the Voice Switch and connect the other end of the cable into the jack on the adapted mouse associated with the right mouse click.
- Adjust the Sound Duration Control and the Speaker Loudness Control on the Voice Switch, such that the person using the Voice Switch can reliably distinguish the activation of the Red and the Green Switch Outputs.

3. How do I use the Voice Switch to train sustained phonation?

- A. Insert one 1/8-inch plug from a provided cable into the Green Switch Output ● on the Voice Switch and connect the other end of the cable into the jack on the counter or a signal device.
- B. Set the Voice Switch to the Voice Only setting ((●).
- C. Adjust the Sound Duration Control such that the Green LED will turn on after the desired time interval.
- D. Adjust the Speaker Loudness Control such that phonation of an adequate (or desired) loudness is produced before the red cue light (LED) is turned on.

4. How do I adjust the Voice Switch so that it does not respond to environmental sounds?

You have two choices. First, you can use the throat microphone rather than a traditional microphone. Set the Voice Switch to the All Sounds setting (●●●●). The throat microphone will not respond to almost all environmental sounds. Second, you can set the Voice Switch to Voice Only ((●), and the switch will activate only when it senses the formants of human speech. In this setting, the switch may respond a bit slower than during the All Sounds setting. This setting will eliminate activations from most non-human sounds.

5. When I use the Voice Switch, I often activate it inappropriately when I cough. How can I eliminate that problem?

Usually, unwanted activations of the Voice Switch associated with a cough can be eliminated. This is

accomplished by turning the Sound Duration Control slightly to the right to increase the duration of sound needed to activate the switch. Also, be certain that the switch is on Voice Only ((●).

6. Sometimes I produce sound when I breathe. How should I set the Voice Switch to eliminate or at least reduce unwanted activations?

Usually, the best way to do this is to turn the Speaker Loudness Control to the right slightly, so that a louder sound is needed to activate the Voice Switch.

7. I am a woman, and I do not activate the Voice Switch as easily as men do when I use the throat microphone and move the Off/On switch to Voice Only. Why does this happen and what should I do?

We have also observed that some women do not activate the Voice Switch as easily as men under these conditions. Try one of these strategies:

- A. Try producing the sound a bit louder.
- B. Produce a different sound. For example, if you are producing the /m/ sound, try the /a/ or the /oo/ sounds.
- C. You can reduce this problem by using a traditional rather than the throat microphone.

8. Sometimes the Voice Switch blinks the LED when there is no sound, but no output action occurs. What's wrong?

The Voice Switch is likely providing feedback to you on the status of the battery. See the section titled "Power On Feedback" on page 6.

TECHNICAL SUPPORT CONTACT INFORMATION

Please Contact your Voice Switch [Distributor](#). If you are unable to obtain support from your distributor contact InvoTek:

InvoTek, Inc.
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User Feedback Overview						
Person	LED	Earpiece	Meaning	Required action	Switch output	
Turn on system	Blinks yellow	Low tone beep	Power is on			
Quiet after turning system on	Blinks GREEN every 6 seconds		Battery is good			
	Blinks RED every 6 seconds		Battery is weak	Replace battery soon		
Makes a sound	RED if the duration requirement not met	Low tone beep	Sound has been heard	Stop making sound to activate red output	Red output activated	
	GREEN if the duration requirement met	High tone beep	Sound has been heard	Stop making sound to activate green output	Green output activated	
Quiet for 3 minutes	Blinks GREEN every 6 seconds		System still on, battery good			
	Blinks RED every 6 seconds		System still on, battery weak	Replace battery soon		
	Alternately blinks RED/GREEN 5 times each second		Battery is very weak	Replace battery now		