EMG Switch

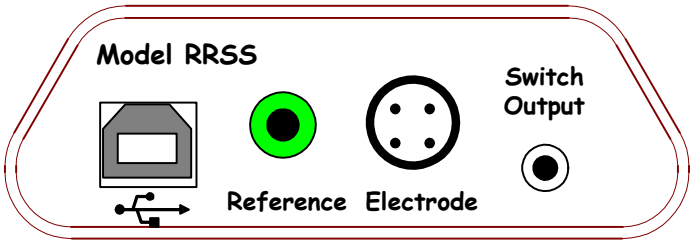
Operation Manual

Introduction

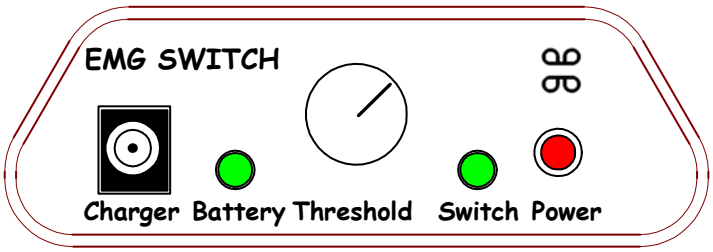
The EMG switch box is designed to convert tiny electromyographic (EMG) signals which are present on the skin near muscle activity into a standard switch closure that can be used to activate assistive technology equipment. The input to the EMG switch box comes from an active electrode, which provides amplification of the tiny signals on the surface of the skin. The EMG switch box continuously monitors the signal from the active EMG electrode, and when the signal level exceeds a user adjustable threshold, a relay is energized providing an isolated switch closure output. The unit is fully battery powered, and can operate for up to 60 hours on a charge. The internal batteries can be recharged using a wall mounted transformer provided with the unit.

Operation

Connect the reference electrode to the rear panel jack labeled REFERENCE. Connect the active electrode to the jack labeled ELECTRODE. Connect the SWITCH OUTPUT through a standard 3.5mm cable and plug to the assistive technology device to be controlled.



Place the reference electrode at some convenient location on the body away from the activation site. After cleaning the area with an alcohol swab, place the active electrode near the muscle site to be monitored. For very weak muscle activity electrode placement is critical. Observe the muscle twitch and place the electrode near the movement site, orienting the electrode in line with the muscle movement.



Press the POWER switch to turn the power on. The power switch for these units is ON when the switch is in the OUT position. When the power switch is first turned on the SWITCH lamp will illuminate. Turn the THRESHOLD knob fully counter clockwise and verify that the SWITCH lamp comes on. Fully counter clockwise corresponds to the lowest threshold setting, and at this setting the switch is closed all the time. Turn the

THRESHOLD knob fully clockwise. Clockwise rotation corresponds to the highest threshold setting. At a fully clockwise setting it takes a very large surface signal to activate the switch. With the muscle site inactive, gradually turn the knob counter clockwise until the SWITCH light is illuminated. Illumination of the light indicates that the switch is active. With the muscle site inactive turn the THRESHOLD knob slightly clockwise to increase the threshold above noise. Ask the user to activate the muscle site, and verify that the light comes on when the site is activated and that the light goes out when muscle site is at rest. It may take some experimentation to optimize the placement of the electrode, and to optimize the setting of the THRESHOLD knob. The lower the threshold setting the more sensitive the device is to surface signals. A higher threshold takes a stronger signal to activate the switch and also minimizes the false triggers.

Battery Charging

The batteries can be charged by connecting the wall adapter to the CHARGER plug on the front panel of the unit. Do not force the charging plug too far into the unit. The plug on these units does not go all the way in to the connector. The charger takes around 8 hours to completely charge the unit. When the battery voltage drops to a low level, the BATTERY lamp flashes red and the unit beeps indicating it is in need of a charge. When the battery has been fully charged the BATTERY lamp flashes green.

Audible Warning

The unit is equipped with an internal timer that monitors the incoming EMG signal. When the EMG signal exceeds the front panel threshold setting for 4 seconds an audible alarm will sound, and the switch will close. This feature can be activated by the user by continuous muscle activation for an extended period of time to summon a caregiver. The audible alarm will also sound if the electrode becomes disconnected from the skin after being connected. The amount of delay time can be programmed over the USB port.

Supplies

This unit uses the DE2-3 signal conditioning electrode manufactured by Delsys™ Inc

Electrode adhesives are available from Delsys at $35 for a pack of 60 stick pads

Dermatrode™ reference electrodes are available from Delsys at $15 for a pack of 20

Delsys Phone Number: 617 236 0599 www.delsys.com

To obtain additional information please contact:

Dinal Andreasen, Application Engineer, tinkertron@mindspring.com 678-778-1511