Model RRSS E-Box

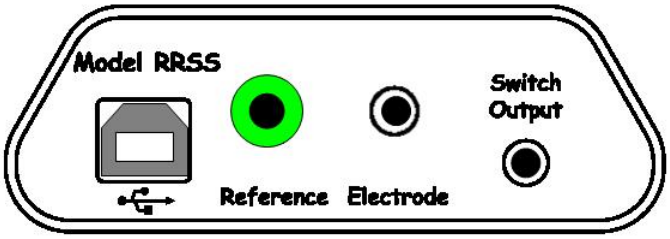
Operation Manual

Introduction

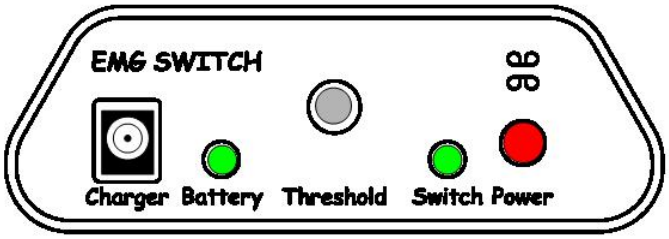
The E-Box is designed to operate in either EMG mode or EOG mode. In EOG mode the unit senses tiny electroculographic (EOG) signals which are present around the eyes and generates a standard switch closure that can be used to activate assistive technology equipment. The input to the switch box comes from two electrodes placed on either side of the eyes. In EMG mode the unit senses surface EMG signals which are present around activated muscle sites and converts these signals to a switch closure. The switch box continuously monitors the signal from the electrodes, 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 green reference electrode to the rear panel jack labeled REFERENCE. Connect the two EOG electrodes 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.



After cleaning the area with an alcohol swab, place the reference electrode on the back of the neck. For EOG pickup, clean the area beside the eyes with the alcohol swab and place the electrodes on the temples. Place the electrode labeled L near the left eye and the electrode labeled R near the right eye.



For EMG pickup, clean the area over the muscle site and place the two electrodes side by side aligned with the direction of muscle movement. Place the reference electrode at a convenient site on the skin over a bony protuberance and away from the active site. Press the POWER switch to turn the power on.

The power switch for these units is ON when the switch is in the IN 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 eyes 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 eyes inactive turn the THRESHOLD knob slightly clockwise to increase the threshold above noise. Ask the user to look to the right, and verify that the light comes on when the eyes move and that the light goes out when eyes are stationary. 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. The charger takes around 8 hours to completely charge the unit. When the charger is connected the BATTERY lamp is continuously green. When the charger is disconnected and the battery has been fully charged the BATTERY lamp flashes green. When the battery voltage drops to a low level, the BATTERY lamp flashes red. After a full charge at the start of operation the battery lamp will flash green. As the battery voltage drops the battery lamp will no longer flash to minimize the current from the battery. The unit typically has around 40 hours of operation in this mode. Near the end of the useful charge in the battery it will begin flashing red. The recommended charging cycle is to attach the unit to the charger once a day for eight hours.

Supplies

This unit uses AgCl conductive adhesive electrodes available through standard medical supply companies. We have been using BioTac brand sold by Kendall.

To obtain additional information please contact:

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