

**OPERATING INSTRUCTIONS**  
**GENERAL DEVICES**  
**MODEL EIM 106L**  
**PREP-CHECK ELECTRODE IMPEDANCE METER**

## **1 OVERVIEW**

The EIM 106L is a hand-held, battery powered devices intended to measure the electrical impedance of bio-potential electrodes applied to patients. Impedance readings, measured at 30 Hz with no D.C. polarizing current, and are presented on a large liquid crystal display. Determination of the quality of the electrode is assisted by “GOOD” and “POOR” lamps that indicate nominal performance. The GOOD/POOR lights are also helpful in locating intermittent connections in cable and lead wires.

Powered by a commonly available 9-volt battery, battery life is enhanced by an Auto-Off feature. The meter also includes a built-in 100K precision test impedance.

## **2 CONTROLS AND INDICATORS**

### **2.1 “ON” BUTTON**

The ON button turns the Prep-Check on. The Prep-Check automatically turns itself off after approximately three (3) minutes.

### **2.2 “GOOD” LIGHT**

The green GOOD light flashes at impedances BELOW 5,000 ohms, indicating an acceptable electrode impedance.

The GOOD light flashes brighter as impedance decreases (improves).

### **2.3 “POOR” LIGHT**

The red POOR light flashes at impedances ABOVE 10,000 ohms, indicating poor electrode contact OR a defective wire or patient cable.

The POOR light flashes brighter as impedance increases (worsens).

The POOR light flashes momentarily for an intermittently defective lead wire or patient cable.

## **2.4 LEAD WIRE/PATIENT CABLE JACKS**

The two safety DIN (shrouded 0.060") jacks accept standard shrouded safety DIN lead wire connectors.

## **2.5 "MODE" SWITCH**

The MODE switch selects between electrode testing (CONTACT) and a built-in calibration test (TEST).

In the CONTACT mode, the impedance of the electrode contact is measured and displayed on the digital display.

The impedance measured represents the SUM of the two electrode connected to the instrument. For example, if one electrode had an impedance of 2K Ohms and the other an impedance of 3K Ohms, the meter would read 5K Ohms.

In the TEST mode, an impedance of 100,000 ohms provided by an internal precision impedance is measured. The digital display must read between 97.0 and 103.0 and the red "POOR" light must be ON.

## **2.6 CONTACT IMPEDANCE DIGITAL DISPLAY**

The CONTACT IMPEDANCE display indicates contact impedance in thousands of ohms (K ohms).

For example, a reading of "50.0" indicates 50,000 (50K) ohms. The highest reading is "199.9" (199,000 ohms). Impedances above 199,000 (199K) ohms read "1. ".

The legend "LO BATT" will appear in the lower left hand corner of the display when the Prep-Check's battery requires replacement.

## **3 OPERATION**

The PREP-CHECK is used to test electrode contact impedance as follows:

- 3.1 Prepare electrode site using recommended procedures.
- 3.2 Attach lead wires to electrodes.
- 3.3 Apply electrodes to prepared sites using recommended procedures.
- 3.4 Place lead wires in the safety DIN jacks of the PREP-CHECK.
- 3.5 Measure impedance.
- 3.6 Good contact is indicated by the green "GOOD" light. The digital readout should read less than 5,000 (5K) ohms (05.0). Poor contact impedance is indicated by the red "POOR" light (impedance GREATER than 15,000 (10K) ohms (10.0).
- 3.7 Electrodes indicating poor may have to be replaced or the site prepped again. A defective lead wire will also indicate poor.

- 3.8 Lead wires are tested by stretching the lead wire with moderate force. A defective lead wire will cause the red “Poor” light to flash or stay on continuously.
- 3.9 Lead wire snaps may be tested by moving them around on the electrode. A bad snap will cause the RED light to flash briefly or stay on continuously.
- 3.10 Remove lead wires from the PREP-CHECK and connect to the monitor cable.

## **4 MAINTENANCE**

The PREP-CHECK needs no maintenance other than routine battery replacement and periodic calibration. Zero and 100 K ohm controls, located on the side (near wrist strap ring) are provided for calibration.

### **4.1 BATTERY REPLACEMENT**

Replace the battery (standard 9 Volt alkaline battery when the “LO BATT” legend appears in the digital display. The battery is located beneath a sliding panel on the underside of the instrument.

### **4.2 ZERO ADJUSTMENT**

To adjust the ZERO reading, connect a wire between the two safety DIN connectors. Set the MODE switch to the CONTACT position. Using a fine screwdriver, adjust the ZERO control through the RIGHTMOST hole on the LOWER side of the instrument for a reading of 00.0. Do not force the control, as this will cause damage.

### **4.3 100K OHM CALIBRATE ADJUSTMENT**

Place the MODE switch in the “T” (TEST) position. Adjust the CAL control through the LEFTMOST hole on the LOWER side of the instrument for a reading of 100.0. Do not force the control, as this will cause damage.

### **4.4 GOOD IMPEDANCE LEVEL ADJUSTMENT**

Connect a resistance decade box to the two safety DIN connectors. Set the MODE switch to the CONTACT position. Adjust the decade box to 5,000 ohms or to another desired GOOD impedance value. Using a screwdriver, adjust the GOOD impedance level control through the small RIGHTMOST hole on the left of the top side of the instrument. Adjust such that the GOOD light just begins to blink. Do not force the control, as this will cause damage.

### **4.5 POOR IMPEDANCE LEVEL ADJUSTMENT**

Repeat above instructions for the GOOD level adjustment, using desired POOR impedance level and LEFTMOST hole on the left of the top side of the instrument. Do not force the control, as this will cause damage. Adjust for 10,000 ohms or to another desired impedance value.

## 5 TECHNICAL SPECIFICATIONS

Measurement Range:.....	100 to 199,900 ohms
Accuracy:.....	+/- 3% of reading, +/-300 ohms
Test Current:.....	9uA(RMS), +/-10%, @ 30Hz, +/-10%
Direct Current:.....	0.0 uA DC
Displays:.....	3 1/2 digit LCD readout GOOD LED @ Z<5K POOR LED @ Z<10K
Self Test: .....	Internal 100K ohm 1% resistor
# Electrodes Tested: .....	2
Electrode Connections: .....	Two safety DIN (0.060" shrouded pins)
User Available Adjustments: .....	Zero, Cal, Good and Poor Levels
Power: .....	9 Volt alkaline battery, type MN1604
Operating Current:.....	21 mA
Battery Test: .....	Continuous, LO-BATT indication on LCD
Battery Access:.....	Slide-off cover
Cabinet: .....	ABS Plastic, 3.6" x 6" x 1.9"

Note: Specifications subject to change without notice.