

Experiment HC-6: Effects of Temperature on Peripheral Oxygen Saturation Levels

Equipment Required

PC or Mac Computer

IXTA, USB cable, IXTA power supply

iWire-B3G ECG cable and electrode lead wires

iWire-PO2-100 Pulse oximeter

Alcohol swabs

Disposable ECG electrodes

Ice, cold and hot water, plastic bag

Note: You must connect the iWire-B3G and the iWire-PO2 sensor to the IXTA prior to turning it on.

ECG Cable and Pulse Oximeter Setup

1. Locate both the iWire-B3G ECG cable and electrode lead wires and the iWire-PO2-100.
2. Insert the connector on the end of the iWire-B3G cable into the iWire1 input on the front of the IXTA.
3. Instruct the subject to remove all jewelry from their fingers, wrists and ankles.
4. Insert the connectors on the red, black, and green electrode lead wires into the matching sockets on the ECG cable.
5. Use an alcohol swab to clean and scrub a region with little or no hair, on the inside of the subject's right wrist. Let the area dry. Another option is to use the area just under each clavicle which will give a better recording.
6. Remove a disposable ECG electrode from its plastic shield, and apply the electrode to the scrubbed area on the wrist/clavicle.
7. Repeat Steps 6 and 7 for the inside of the left wrist/clavicle and the inside of the right ankle/abdomen.



Figure HC-6-S1: A iWire-B3G ECG cable with 3 lead wires connected to an IXTA.

8. Snap the lead wires onto the electrodes, so that:
 - The red (+1) lead is attached to the left wrist or under the left clavicle,
 - The black (-1) lead is connected to the right wrist or under the right clavicle,
 - The green (C or ground) lead is connected to the right leg or on the abdomen.
9. Locate the iWire-PO2 pulse oximeter. Make sure it is plugged into the iWire 2 input.
10. Clip the photoplethysmograph sensor over the end of the subject's left middle finger. An embossed diagram on the sensor indicates the position of the finger within the clip. The indicator light on the pulse oximeter amplifier will stop blinking when the sensor is working properly.
11. Instruct the subject to sit quietly with their hands in their lap. If the subject moves, the ECG trace will move off the top or bottom of the screen. If the subject moves any muscles in the arms or upper body, electromyograms (EMGs) from the muscles will appear on the ECG recording as noise.

Units Conversion for the Pulse Oximeter

The settings file, ECG-iWirePulseOx, has programmed the software to express the units on the Y-axis of the Oxygen Saturation channel as %O₂ Sat.

Warning: The photoplethysmograph sensor passes two wavelengths of light through the subject's fingernail. For proper recording, the subject's fingernail should not be covered with nail polish, artificial nails, or any coating, clear or otherwise.



Figure HC-6-S2: The iWire-PO2-100 pulse oximeter.