OXY-MRI – SPO$_2$ MODULE WITH SENSOR FOR HUMAN MRI

**MRI Use:** MR Conditional

**Condition:** Must use MR finger sensor and max MR field strength 3T; module stays in control room.

OXY-MRI is a stand-alone system for adult human pulse oximetry (SpO$_2$) in the MRI; it can also be used with a BIOPAC MP160/150 Research System.

The system includes a SpO$_2$ amplifier and a fiber-optic oximetry sensor for the finger, plus a signal isolation adapter INISOA and interface cables to connect to an existing BIOPAC AMI100D or HLT100C (high level transducer interface module) for MP Research Systems. Additional finger sensors are available as OXY-MRI-SENSOR.

The SpO$_2$ amplifier is used in the MRI control room, the 9 m fiber-optic sensor cable is passed through the patch panel, and the finger sensor is attached to the subject in the MRI chamber room. MRI-rated to 3.0 Tesla.

! OXY-MRI is not intended for animal use.

**SYSTEM COMPONENTS**

**System includes:** SpO$_2$ amplifier and pulse oximetry sensor for stand-alone use, plus INISOA signal isolator and dSUB9 cable to connect SpO$_2$ amp analog out to INISOA for use with a BIOPAC Research System.

**Note:** When simultaneously recording biopotential signals from a subject, or for safety in cases when the system is electrically connected to the subject (for recording or stimulation,) a BIOPAC AMI100D or HLT100C (not included) is required in order to connect the INISOA to the MP160/150 unit. If more than one OXY-MRI signal is to be recorded using the AMI100D or HLT100C, an additional INISOA can be obtained by contacting BIOPAC. (Only one INISOA is included in the OXY-MRI system.)

If not recording biopotential signals, the OXY-MRI cable can be connected directly to the UIM100C.
**SPECIFICATIONS**

**Oxygen Saturation Display Range:** 0–100% SpO2  
**Pulse Rate Range:** 18–321 BPM  
**Saturation Accuracy** (Arms): 70–100% ± 2 digits  
*Note:* ± 1 Arms represents approximately 68% of measurements  
**Pulse Rate Accuracy:**  
*no motion* 18–300 BPM ± 3 digits  
*low perfusion* 40–240 BPM ± 3 digits  
**Displays:**  
*Pulse Strength*: LED, Bar graph, tri-color segments  
*Alarm Indicator*: LED, bi-color  
*Alarm Silenced*: LED, amber  
*Numeric Displays*: 3-digit, 7-segment LEDs, green  
*Low Battery*: LED, amber  
**Analog Outputs:**  
*SpO2 Output Range*: 0-1 VDC (0–100% SpO2), 1.27 VDC (out of track)  
*Pulse Rate Output Range*: 0-1 VDC (0–300 BPM), 1.27 VDC (out of track)  
*Event Marker*: 0 V (no event), 1 V (event occurred)  
*Accuracy*: ± 2% (SpO2), ± 5% (Pulse Rate)  
*Load Current*: 2 mA maximum  
**Memory**: 70 hours (assuming continuous operation)  
**Temperature**  
*Operating*: 0° C to +40° C (32° F to 104° F)  
*Storage/Transportation*: -30° C to +50° C (-2° F to 122° F)  
**Humidity**  
*Operating*: 10–90% noncondensing  
*Storage/Transportation*: 10–95% noncondensing  
**Altitude**  
*Operating*: up to 12,000 meters (40,000 feet)  
*Hyperbaric Pressure*: up to 4 atmospheres  
**Mains Power Requirements**: 100–240 VAC 50–60 Hz  
**Internal Power Requirements**  
*Battery*: 7.2 volt NiMH battery pack  
*Operating Life (fully charged battery)*: 16 hours minimum  
*Storage Life*: 21 days minimum  
*Recharge Rate*: 4 hours maximum  
**Dimensions**: Approximately 219 mm (8.6") W x 92 mm (3.6") H x 142 mm (5.6") D  
**Weight**: Approximately 900 grams (2 lbs) with battery  
**Warranty**: SpO2 amplifier: 3 years; pulse oximetry sensor: 90 days  
**Classification per IEC 60601-1/CSA601.1/UL60601-1:**  
*Type of Protection*: Internally powered (on battery power)  
*Degree of Protection*: Type BF-Applied Part  
*Mode of Operation*: Continuous  
*Enclosure Degree of Ingress Protection*: IPX2
ACQKNOWLEDGE CALIBRATION (AMI100D or HLT100C)

1. Launch AcqKnowledge. The “Add new module” dialog should appear. If it does not, choose “MP160/150 > Set Up Data Acquisition > Channels.”

2. Choose “AMI100D-A1 or HLT100C-A1” from the module list and choose “Add.”

3. Select “OXY-MRI SPO2 Module Human-SPO2” from the “Transducer” list and click OK.

4. Follow the OXY-MRI SPO2 calibration and sensor prompts in order of appearance. (AcqKnowledge 4.4.2 and higher only.)

5. Choose “Add new module” and choose “AMI100D-A2 or HLT100C-A2” from the list and click “Add.”
6. Select "OXY-MRI SPO2 Module Human-Pulse Rate" from the “Transducer” and click OK.

7. Follow the OXY-MRI Pulse Rate calibration and sensor prompts in order of appearance. (AcqKnowledge 4.4.2 and higher only.)

If the sensors are not properly connected, the following dialog will appear. Check the connections and click “Retry.”
ACQKNOWLEDGE CALIBRATION (UIM100C)

1. Launch AcqKnowledge. The “Add new module” dialog should appear. If it does not, choose “MP160/150 > Set Up Data Acquisition > Channels.”

2. Choose “UIM100C-A1” from the module list and choose “Add.”

3. Choose “Custom” from the “Transducer” list and click OK to open the Scaling dialog.

4. Enter Cal 1, Cal 2, and Units Label as shown below and click OK.

5. Choose “Add new module” and choose “UIM100C-A2” from the module list, and click “Add.”

6. Choose “Custom” from the “Transducer” list and click OK to open the Scaling dialog.

7. Enter Cal 1, Cal 2, and Units Label as shown below and click OK.