Small Animal Monitoring and Gating Compatible with MR, PET, CT, SPECT and Optical

Monitoring

- ECG
- Temperature
- Respiration
- Blood pressure
- Pulse oximetry
- Capnography
- Minimally invasive fiber optic pressure
- Auxiliary channels

Gating

- ECG
- Respiration
- Blood pressure

Heater system with temperature control

Ventilator with remote pneumatic valves

Waveform & trend data acquisition

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Monitoring and Gating Systems for use in Imaging and Laboratory Environments

SAII's monitoring and gating systems have been specifically designed to meet the physiological monitoring and gating needs for anesthetized mice, rats and larger animals in the MR, PET, CT, SPECT, optical and laboratory environments. Data acquisition modules located near the animal acquire physiological data from a variety of sensors. The data is processed and transmitted to a PC. The PC displays multiple waveforms, measured values, trends and gating pulses. The data acquisition modules are user controlled, in real time, from the PC by menu driven software.

Monitoring and Gating Parameters

ECG is measured using two or three leads with sub-dermal needle electrodes, gold disk surface electrodes or radio translucent pads. The 3rd lead improves baseline stability. The waveform is processed to detect R-waves, generate cardiac gates and determine the heart rate.

Temperature is measured by fiber optic and/or thermister temperature probes. Thermister probes are economical. Fiber optic probes are artifact free and can not heat during MRI. Multiple channels are available.

Respiration is obtained from a small pneumatic pillow sensor placed next to the animal's abdomen or from the ECG waveform. The respiration waveform is processed to detect inspiration, expiration and respiration rate.

Blood pressure is measured using a pressure transducer connected with small bore tubing to an invasive line in the animal. The waveform provides systolic, diastolic and mean arterial pressure. Multiple channels are available.

Oxygen saturation is determined from the differential absorption of red and infrared light transmitted through a peripheral vascular region. Fiber optic oximetry sensors can be attached to the tail, foot, ankle, thigh or ear.

End-tidal CO_2 or expired CO_2 measurements for animals as small as mice are obtained by a Capnograph module with very low sample flow requirements.

Minimally invasive pressure measurements are obtained using ultra-miniature fiber optic pressure sensors placed in small infusion needles or catheters.

Auxiliary input channels allow the user to record, display and gate from user generated analog signals.

Accessories

Heater System regulates the temperature of small animals based on a user defined set point and the animal's measured temperature.

Ventilator with remote, miniature, pneumatic valves provides volume ventilation for animals as small as mice.

Laboratory Monitoring System helps with animal prep before moving to the imaging environment.

Signal Breakout Module gives real time access to all measured data including rates, gates and waveforms.

Universal Gating Kit is used for clinical imaging systems.

Micro-imaging Kit is used for micro-MR imaging systems.

Specifications:

ECG	range:	40 - 900 BPM
	accuracy:	±1%
	input range:	±2.50 mV
	input Impedance:	>10 MΩ @ 10 Hz
Temp fiber optic	tip diameter	1.0 and 3.0 mm
	range	20 – 60 ºC
	accuracy	±0.2 ºC
	channels	up to 4
Temp thermister	tip diameter	1.0, 2.5 and 3.0 mm
	range	15 – 70 ºC
	accuracy	±0.2 ºC
Resp	range	20 - 450 bpm
	accuracy	1 count
	sensor type	pneumatic pillow, ECG
IBP	display range	0 – 300 mmHg
	rate accuracy	±1%
	channels	up to 3
Pulse Oximetry	heart rate range	40 – 700 BPM
	rate accuracy	±1.7%
	SpO_2 range	0 – 100%
	SpO_2 resolution	1 count
	probe types	fiber optic: mouse tail/ankle, small, large and extra large clip
CO2	range	0 – 10%
	respiration rate	5 – 200 breaths/minute
	sample flow	5 – 50 ml/minute
Pressure	probe type	fiber optic
	tip diameter	0.3 and 0.4 mm
	channels	up to 3
Aux inputs	input signal	0 - 5 V
	channels	up to 4
Gating	R-wave to gate delay	selectable - 0 ms to 600 ms
	expiration gate width and delay	selectable - 1 ms step size
Heater	temp control	fiber optic PWM
Ventilator	respiratory rate	5 – 150 breaths/minute
	inspiratory flow	50 – 1000 ml/minute
	tidal volume	0.1 – 30 ml

PC requirements: Windows software, serial or USB port, CD reader.

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