

# MR-compatible Small Animal Monitoring and Gating Systems

## Monitoring

- ECG
- Temperature
- Respiration
- Pressure pulse
- Blood pressure
- Oximetry
- Auxiliary channels



## Gating

- ECG
- Respiration
- Peripheral pulse

Heater system with temperature control

Waveform & trend data acquisition

The **Model 1025 monitoring and gating system** was designed specifically to meet the physiological monitoring and gating needs for anesthetized mice and rats in the MR environment. The system consists of data acquisition modules located near the animal in the magnet bore and a Control/Gating Module connected to a PC located near the operator console. The PC displays multiple waveforms, measured values, trends and gating pulses. The data acquisition modules are controlled by menu driven software from the PC.

The **ECG/Temperature Module** resides in the magnet bore near the animal. It measures temperature with a small rectal probe, ECG using two leads with needle or surface electrodes and respiration from the movement of an ECG lead in the strong magnetic field. Power is supplied by an external, rechargeable battery. ECG, respiration and temperature measurements are transmitted out the magnet bore on an optical fiber to the Control/Gating Module.

The **Respiration/IBP Module** resides just outside the magnet bore. Respiration is measured using a small pneumatic pillow. Blood Pressure is measured using pressure transducers connected with tubing to invasive lines in the animal. Auxiliary input channels allow the user to acquire, record, display and gate from user generated analog signals. Power is supplied from an internal battery and an external 12 VDC power supply.

The **Control/Gating Module** receives data from the acquisition modules using optical fibers. The module sends data to the PC for display and receives instructions from the PC to control measurement and gating functions. ECG and/or respiratory gates are generated by the Control/Gating Module's microprocessor and sent to the MR system. The delay from the R-wave peak to the MR system gate is user selectable as is the expiration gate delay and width. The module also controls a heating system which regulates the temperature of the rodent.

**Compatible with all MR systems: all manufacturers and all field strengths**

### Specifications:

#### ECG/Temperature:

<b>ECG</b>	Range:	40 - 900 BPM
	Accuracy:	±1%
	Input range:	-2.50 mV to 2.5mV
	Input Impedance:	>10 MΩ @ 10 Hz
	CMRR:	100 dB @ 60 Hz
<b>Temp</b>	Probe types	skin, rectal
	Range	0 - 100 °C
	Accuracy	+/-0.2 °C, 10-70°C
<b>Module</b>	Power - battery	rechargeable
	Battery life:	>15 hours
	Time to full charge	<2 hours
	Size: hxwxcm	2.1x5.1x14.0

#### Respiration/IBP:

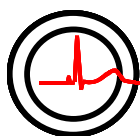
<b>Resp</b>	Range	15 - 300 bpm
	Accuracy	1 count
<b>IBP</b>	Display range	0 - 300 mmHg
	Channels	3
<b>Module</b>	Auxiliary inputs	±5 V
	Power	+12 VDC & battery
	Size: hxwxcm	4.2x15.8x15.0

#### Control/Gating:

<b>Gating</b>	R-wave to gate delay	selectable - 0 ms to 600 ms
	Expiration gate width and delay	selectable - 1 ms step size
<b>Temp</b>	Heater control	fiber optic PWM
	Size: hxwxcm	3.8x13.3x12.5

#### PC requirements:

<b>Software:</b>	Windows 95, 98, 2000, XP or Vista
<b>Hardware:</b>	>1 GHz processor, Serial or USB communication port, CD reader



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