

# MR-compatible Small Animal Monitoring and Gating System

## Monitoring

- ECG
- Respiration
- Temperature

## Options

- Blood pressure
- Oximetry
- Capnography
- Micro-pressure



## Gating

- ECG
- Respiration
- ECG & respiration

Heater system with temperature control

Waveform & trend data acquisition

The **Model 1030 monitoring and gating system** is a 3<sup>rd</sup> generation system designed specifically to meet the physiological monitoring and gating needs for anesthetized mice, rats and larger animals in the MR environment. The system consists of an ERT data acquisition module located in the magnet bore near the animal and an ERT Control/Gating Module connected to a PC located near the operator console. The PC displays multiple waveforms, measured values, trends and gating pulses.

The in bore **ERT Module** measures ECG using three leads with needle or surface electrodes, respiration from a small pneumatic pillow sensor and/or from the movement of one ECG lead in the strong magnetic field and temperature with a small rectal thermister probe. 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 ERT Control/Gating Module.

The **ERT Control/Gating Module** receives data from the ERT Module and any of several optional acquisition modules. The ERT Control/Gating Module sends data to the PC for display and receives user instructions from the PC to control measurement and gating functions. Gates from ECG, respiration and any of the available options are generated by the ERT 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 can regulate the temperature of the animal.

The following **options** are available for use with the Model 1030: invasive blood pressure (IBP) measuring systolic, diastolic and mean arterial pressure, pulse oximetry using fiber optic sensors to measure oxygen saturation (SpO<sub>2</sub>), heart rate and pulse distension, capnography measuring end-tidal and minimally inspired CO<sub>2</sub>, a ventilator regulating respiration, ultra-miniature fiber optic pressure (FOP) sensors to make minimally invasive pressure measurements and fiber optic temperature (FOT).

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

### Specifications:

#### ERT Module:

<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>Resp</b>	Range	15 - 300 bpm
	Accuracy	1 count
	Sensor	pneumatic pillow and/or ECG lead
<b>Temp</b>	Probe types	thermister
	Range	10 - 70 °C
	Accuracy	+/-0.2 °C
<b>Module</b>	Power - battery	rechargeable
	Battery life:	>15 hours
	Time to full charge	<2 hours
	Size: hwxwd cm	2.1x5.1x14.0

#### ERT Control/Gating Module:

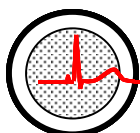
<b>Gating</b>	R-wave to gate delay	user selectable
	Expiration gate width and delay	user selectable - 1 ms step size
<b>Temp</b>	Heater control	fiber optic PWM
	Size: hwxwd cm	3.8x13.3x12.5

#### Optional Modules:

<b>IBP</b>	Display range	0 - 300 mmHg
	Channels	3
<b>SpO<sub>2</sub></b>	Range	70 - 100%
	Heart rate	40 - 700 BPM
<b>CO<sub>2</sub></b>	end-tidal range	0 - 9.9%
<b>FOP</b>	Range	0 - 300 mm Hg
	Channels	3
<b>FOT</b>	Range	20 - 60 °C
	Channels	4

#### PC requirements:

**Software:** any Windows including seven  
**Hardware:** >1 GHz processor, Serial or USB communication port, CD reader



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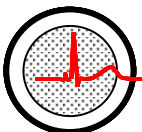
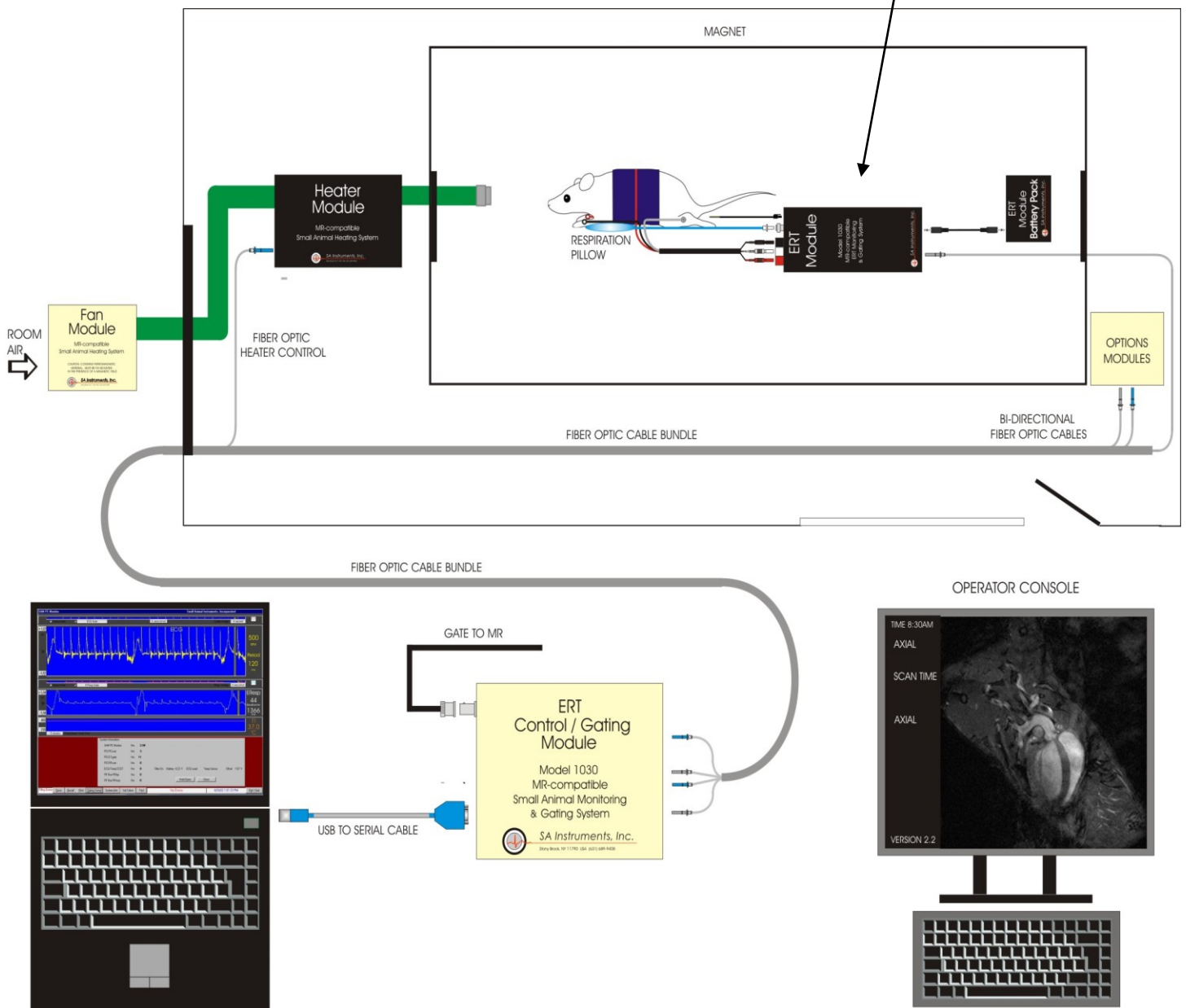
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# Next Generation MR-compatible Small Animal Monitoring and Gating System

New ERT Module with 3-lead ECG, respiration & temperature



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