

MR-compatible Small Animal Monitoring and Gating System for Magnetic Particle Imaging

Monitoring

- Respiration
- Fiber Optic Temperature

Options

- Pulse Oximetry
- Heater to regulate temperature



Gating

- Respiration
- Cardiac with Pulse Oximetry option
- Respiration and Cardiac

Waveform & trend data acquisition

The **Model 1040 monitoring and gating system** was designed specifically to meet the physiological monitoring and gating needs for anesthetized rodents in MPI scanners. The Model 1040 consists of a Respiration/Temperature data acquisition module located just outside the magnet near the animal 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 Model 1040 is MR and CT-compatible.

The Model 1040 Control/Gating Module sends and receives digitized data over two fiber optic cables to and from the Respiration/Temperature Module. It sends data to the PC for display and receives user instructions from the PC to control measurement and gating functions. Gates generated by the Control/Gating Module's microprocessor are sent to the MPI system. Gate delay and width are user selectable.

The Control/Gating Module has the capability to control an air heating system which can regulate the temperature of animals undergoing MPI. The system has a MR-compatible Heater Module that is positioned near the magnet bore and a Fan Module located outside the magnet room.

Pulse oximetry can be added to provide heart rate, oxygen saturation, a cardiac waveform and cardiac gates. The Pulse Oximetry Module is positioned near the magnet with the Respiration/Temperature Module and uses a fiber optic sensor to monitor the rodent in the magnet.

Specifications:

Respiration/Temperature Module:		
Resp	Range	15 - 300 bpm
	Accuracy	1 count
	Sensor	pneumatic pillow
Temp	Range	20 - 60 °C
	Accuracy	±0.2 °C
	Sensor	fiber optic, 1 mm OD
Control/Gating Module:		
Gating	Respiration & cardiac gate width and delay	user selectable - 1 ms step size
Temp	Heater control	fiber optic PWM
Inputs	Aux BNC & fiber optic	1 each
Outputs	BNC gate	2 each
	Fiber optic gate	1 each
Pulse Oximetry Module:		
Rate	Fiber optic sensor	tail, ankle
	Range	40 - 700 BPM
	Accuracy	±1%
SpO2	Range	0 - 100%
	Resolution	1 count

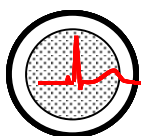
The modules above all operate with 12 VDC power and have size hwxwd of 3.8x13.3x12.5 cm.

Air Heater System:

Heater	Power	100/115/230 VAC
	Size hwxwd cm	16.4x8.9x26.0
Fan	Power	100/115/230 VAC
	Size hwxwd cm	6.4x18.9x18.4

PC requirements:

Software: any Windows including 10
Hardware: >1 GHz processor, USB ports, display 1360 x 768 or greater



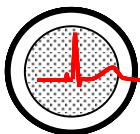
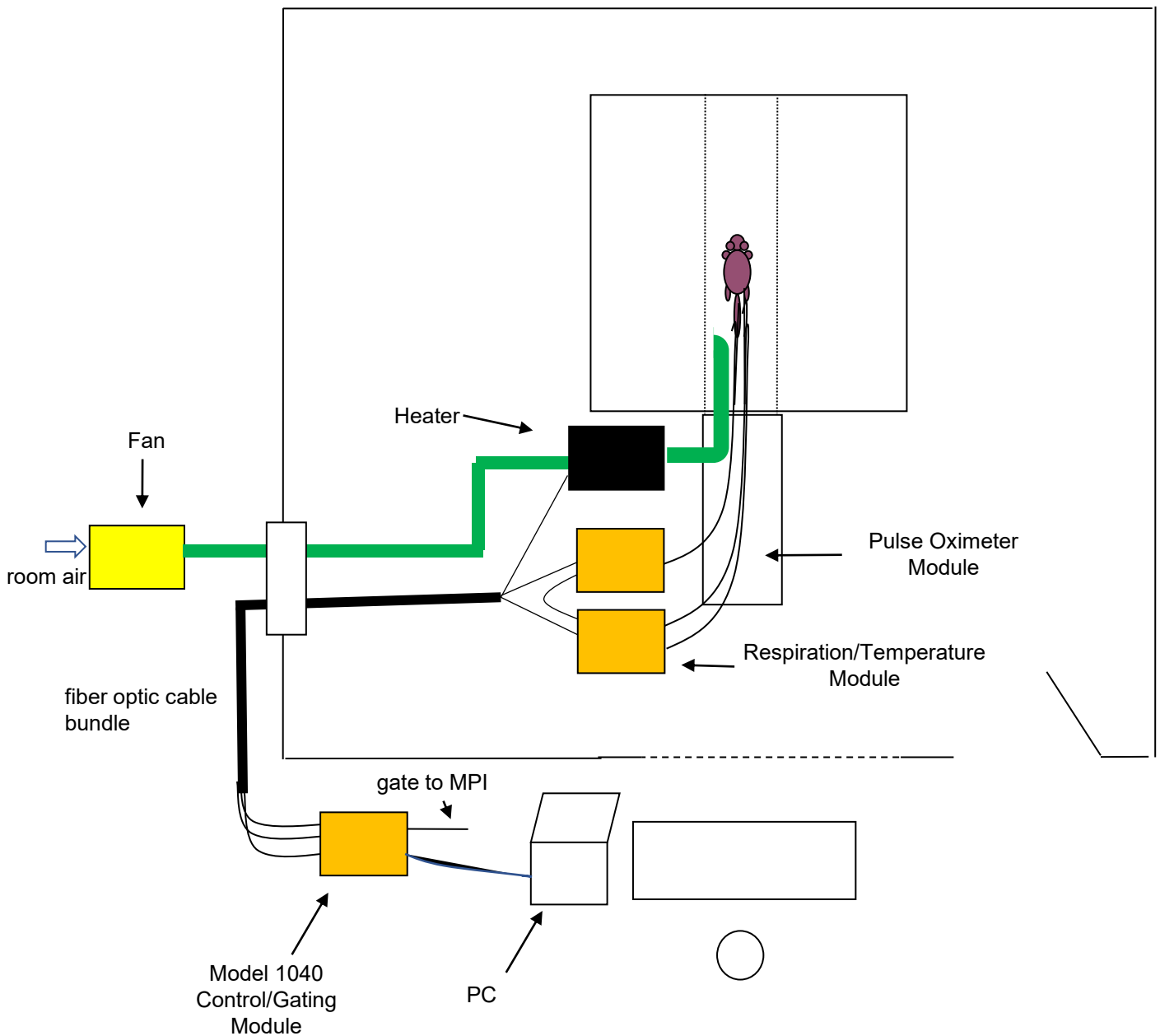
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