

MAVEn™ System

Automated metabolic phenotyping of 16 *Drosophila* in a benchtop system

The Sable MAVEn™ system is an integrated, compact 16-channel flow generator for small insect flow-through respirometry. It provides metabolic measurement of up to 16 animals.

Compact and cost-effective, the MAVEn packs unprecedented metabolic measurement power and versatility into a slim, easy-to-use instrument.

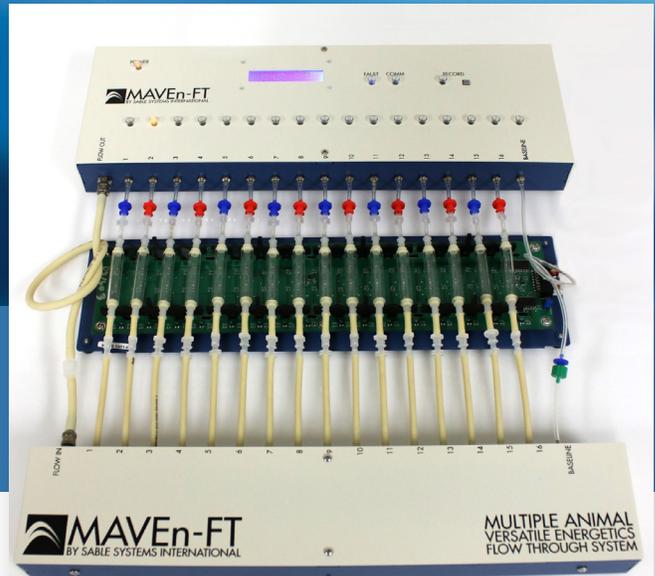
Metabolic Measurement

MAVEn™ maintains 16 simultaneous, individual air flows that can be regulated over the range of 5 mL/minute up to 200 mL or more/minute. Each flow is pushed into a sealed container holding an experimental animal. The system automatically selects the air flows from each chamber in succession, with optional baseline interleaving, and directs that air flow to external



gas analyzers. Approximately matched flow rates are maintained through all channels simultaneously, minimizing the likelihood of hypoxia or hypercapnia within the chambers.

The voltage output from each analyzer is measured by a high resolution (16 bit) analog-to-digital converter. Up to 6 external voltages can be



FEATURES

Maintains 16 simultaneous individual air flows from 5 mL/min to 200 mL/min

Selects the air flow from each chamber in succession and directs that air flow to external gas analyzers

Six external voltages can be measured by a high resolution (16 bit) analog-to-digital converter

Fully programmable for all aspects of operation

Can operate under computer control or as a stand-alone instrument

Records data to a computer or to an internal SD card

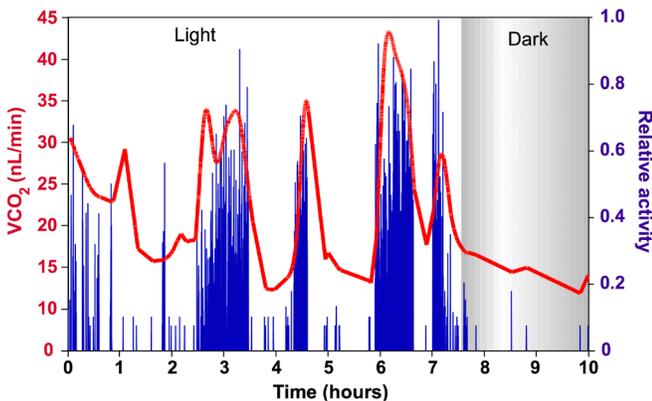
Data files can be loaded directly into Sable Expedata or Microsoft Excel for further analysis



monitored and voltages can be transformed to user-defined units. Gas analyzers may include O₂, CO₂, H₂O, or any other detectable gases. Animal activity levels, barometric pressure, ambient temperature and light levels can also be monitored.

Data Management and Reporting

MAVEN is fully programmable for all aspects of its operation and can operate under computer control or as a stand-alone instrument. The system can record data to a computer, or to an internal SD card. The data are date and time stamped using an accurate internal real-time clock. MAVEn files can be loaded directly into Sable Systems ExpeData or Microsoft Excel for further analysis.



Second-by-second activity of a single fly over a 10-hour period in a multiplexed arrangement of N=16 flies. Activity monitoring and VCO₂ demonstrate the MAVEn's ability to identify periods of rest and activity and how VCO₂ closely tracks activity levels. Further, the data show how activity changes with photoperiod.

SPECIFICATIONS

INLET AIR	Supplied by user; pressure (2 kPa up to 200 kPa) depends on maximum flow rate desired; may be tank or pumped air of any composition; optional pump available
NUMBER OF SIMULTANEOUS PUSH FLOW STREAMS	16 animal channels plus baseline
FLOW RATE RANGE	5 mL/minute to 200 mL/minute, mass flow, precisely controlled via a PID loop
FLOW RATE ACCURACY	2% of reading + 1 mL/minute typical
DWELL TIME PER ANIMAL	Programmable from 15 seconds to 3 hours
BASELINE DURATION	Programmable from 15 seconds to 3 hours
BASELINE INTERLEAVING	Programmable from every chamber switch to every 16 chamber switches
ANIMAL ACTIVITY DETECTION	Available as optional accessory; recorded with temperature and light level in the data stream
SD CARD SUPPORT	SD card (up to 32 GB) data saved as date- and time-stamped .csv files
REAL TIME CLOCK	Accurate to 1 minute/year
ANALOG INPUTS	6 inputs; 16 bit resolution (1 part in 65,536); range -5V to +5V; typically used to capture analog data from user-supplied gas analyzers
ANALOG INPUT CONNECTIONS	BNC female sockets
BAROMETRIC PRESSURE MEASUREMENT	Resolution 1 Pa (0.001 kPa); Accuracy 0.05%
LIGHT LEVEL	0.1 to 5000 Lux
AMBIENT TEMPERATURE MEASUREMENT	Resolution 0.01 deg C, Accuracy ±0.25 deg C
DIGITAL COMMUNICATIONS	(modified RS-232 multidrop) or spooling at 1 sec intervals
POWER	10 – 15 VDC at < 1 Amp



Sable Systems International
3840 N. Commerce Street
North Las Vegas, NV 89032, USA
TELEPHONE:
US: +1 800 330 0465 / + 1 702 269 4445
EMAIL: sales@sablesys.com

www.sablesys.com



Sable Systems Europe GmbH
Ostendstr. 25
D-12459 Berlin, Germany
TELEPHONE: +49 30 5304 1002
MOBILE: +49 176 2078 7008
FAX: +49 30 5304 1003