

LEM

## Laboratory Environment Monitor



- Monitors barometric pressure, temperature, humidity and air density
- Communicates via RS-232 or RS-485
- Includes software to display all parameters in addition to data logging and calibration
- Precision to 0.1 °C, 1.3 mbar and 3% RH
- Ideal for calibration labs, clean rooms, storage facilities or use with Ruska piston gauges
- Replaces mechanical strip chart recorders



	Pressure mbar	Temperature °C	Humidity %RH	Air Density g/cm³	Notes	Log
04/16/2005	1014.1	22.21	80.0	1.1890-3	Pressure Lab	●
04/16/2005	1014.1	22.21	80.0	1.1890-3	Process Lab	●
04/16/2005	1014.1	22.21	80.0	1.1890-3	Structural Lab	●
04/16/2005	1014.1	22.21	80.0	1.1890-3	Industrial Shop	●
04/16/2005	1014.1	22.21	80.0	1.1890-3	Wdg. 1	●
04/16/2005	1014.1	22.21	80.0	1.1890-3	Warehouse	●
04/16/2005	1014.1	22.21	80.0	1.1890-3	Clean Room A	●
04/16/2005	1014.1	22.21	80.0	1.1890-3	Clean Room B	●

## Specifications

### PRESSURE RANGES

The Laboratory Environment Monitor (LEM) provides the ability to measure barometric pressure, ambient temperature, relative humidity and air density. The LEM transmits these measurements via an RS-232 or RS-485 interface to a PC. The supplied software can then be used to monitor and log all the above parameters for one, or up to eight LEM's, simultaneously.

The supplied software allows the LEM to be used as a stand alone instrument and performs a variety of functions, including various units selection, as well as data logging. The LEM is an ideal replacement to older data loggers such as mechanical strip chart recorders. The software includes options for logging in intervals of 1 minute, 5 minutes or 15 minutes. The space delimited text file keeps file sizes small, while allowing easy insertion into spreadsheet applications for data analysis and graphing. The LEM also provides air density measurement – a critical factor for mass calibration labs to correct for air buoyancy effects.

Annual recalibration of the LEM is accomplished through the supplied software. Once calibrated, the new coefficients are downloaded to the LEM and stored in non-volatile memory.

If a barometric pressure accuracy better than 1.3 mbar is required, a variety of digital barometers with an RS-232 interface can be directly connected to the LEM. The LEM will transmit the barometric pressure reading from the external barometer to the PC and LEM software via a single communication link.



The LEM is compatible with Ruska's Model 2456 Piston Gauge Monitor (PGM) and WinPrompt® software which automates the operation of Ruska's extensive line of primary pressure standards. The LEM allows WinPrompt® to automatically compensate for air buoyancy effects on the mass set of the piston gauge. The LEM is also compatible with the Model 2465 Autofloat Gas Piston Gauge.

### Ruska Instrument Corporation

P.O. Box 630009, Houston, TX 77063-0009

(713) 975-0547 ■ Fax (713) 975-6338

E-mail: sales@ruska.com ■ www.ruska.com

■ A Druck Company ■ www.pressure.com

### GENERAL

**Temperature:** 18 – 28 °C  
**Pressure:** 690 – 1150 mbar  
**Humidity:** 5 – 95% RH

### PERFORMANCE

#### Precision<sup>1</sup>

Temperature: ± 0.1 °C  
 Pressure: ± 1.3 mbar  
 Humidity: ±3% RH

#### Total Uncertainty<sup>2</sup>

Temperature: ± 0.5 °C per year  
 Pressure: ± 2.6 mbar per year  
 Humidity: ± 10% RH per year

#### Warm up time

30 minutes

#### Data update

1 second

### SOFTWARE/PC

Requires Microsoft® Windows® 95 or higher  
 1.6MB of available hard-disk space, 32MB RAM  
 RS-232 or RS-485 interface  
 Includes extensive help system  
 Manual includes syntax commands

### GENERAL

#### Units

Temperature: °C or °F  
 Pressure: mmHg, cmHg, inHg, kPa, mbar, psi, kg/cm<sup>2</sup>  
 Humidity: %RH  
 Air Density: g/cm<sup>3</sup>, kg/m<sup>3</sup>, lb/in<sup>3</sup>

#### Power

10-36 VDC, 250 mA max. (supplied with 115/230 AC adapter)  
 Optional power via RS-485

#### Communication

RS-232 or RS-485

#### Temperature

Operating : 18 to 28 °C  
 Storage : -20 to 70 °C

#### Humidity

5% to 95% relative humidity, non-condensing

#### Physical

133 mm h x 83 mm w x 32 mm d, 0.23 kg

*1 Precision is defined as the combined effects of linearity, repeatability and hysteresis.*

*2 Expression of accuracy (uncertainty) conforms with the recommendations of the ISO Guide to the Expression of Uncertainty in Measurement and includes RSS of precision, stability, temperature effects, and the calibration standard to 2 sigma (95%).*

Agent: