Application Notes

1. Sensor Self-Heating: The HS-2000D dissipates up to 75 milliwatts when operating and can generate sufficient heat to cause shifts in relative humidity and temperature measurements. The sensor duty cycle should be limited to 10% or less to prevent self heating. The sensor should only be powered by raising the RTS line high while a measurement is being taken. The RTS line should then be driven low. A blocking diode incorporated in the sensor prevents any power dissipation when the RTS line is low. The software used to read data from the HS-2000D must properly drive the RTS line in addition to reading the sensor data. The data logging and display application program supplied with the sensor will properly drive the RTS line. Sample code is also available in both C and BASIC to assist in custom application development

2. PCB Connectors: It is recommended that HS-2000D be socketed rather than soldered to circuit boards. If a direct solder connection is required, it is recommended that hand-soldering be performed using a rosin-based flux. The soldered surfaces may be cleaned with isopropyl alcohol (do not immerse).
The recommended PCB sockets include:

Surface Mount:
Mill-Max: 310-93-104-41-105, 4 pin SMT, Left hand footprint, 30 micro inch gold plate
Mill-Max: 310-93-104-41-107, 4 pin SMT, Right hand footprint, 30 micro inch gold plate
These sockets are available from Digi-Key in 64 pin strips. See part number ED23064-ND
Through hole:
Mill-Max: 310-93-104-41-001, 4 pin standard solder tail, 30 micro inch gold plate
These sockets are available from Digi-Key in 63 pin strips. See part number ED7063-ND

3. Chemical Resistance:
data on resistance to specific chemicals and environments. Contact Precon for

4. Software, source code, and labview driver can be downloaded from the Precon website. The program installs on the C Drive. C: Program Files/Precon

Warranty
WARRANTY: The Seller warrants that Warranted Goods shall not fail to function in accordance with the seller's specifications because of defects in material or workmanship, for one year from the date of purchase. The foregoing warranty is expressly in lieu of all other warranties, express or implied, including warranties of merchantability or fitness for a particular purpose, or any other matter with respect to the goods are excluded and shall not apply to the goods sold. The warranty undertaking in this agreement does not apply to any goods that have been subjected to accident, disaster, loss or damage during shipment, neglect, misuse, improper installation, corrosive atmosphere harmful to electronic circuitry, excessive electromagnetic fields, failure or insufficiency of electrical power or unusual electrical surge or shock, nor to dysfunction or malfunction of, or caused by, any other equipment or device (other than equipment or devices you have purchased from us) to or in which such goods have been attached or installed.
Seller's employees, agents and/or representatives may have made oral statements about the goods sold or to be sold. Such statements DO NOT constitute warranties and ARE NOT part of a sales Contract. Seller's liability to Buyer, their agents, employees, customers, assigns, successor or other related parties for any and all losses or damages resulting from Seller's breach of a sales Contract, whether in tort or in contract or otherwise, shall be limited to the replacement of a like quantity of goods sold and IN NO EVENT SHALL SELLER BE LIABLE FOR SPECIAL, INDIRECT, INCIDENTAL, CONSEQUENTIAL, OR CONTINGENT DAMAGES (including, without limitation, loss of anticipated profits, business interruption, loss or use or revenue, litigation costs, cost of capital, Buyer's fixed costs, or avoidable costs).

All specifications are subject to change without notice. For the latest specifications, visit our website at www.preconusa.com

DATA SHEET HS-2000D
RH & TEMPERATURE SENSOR

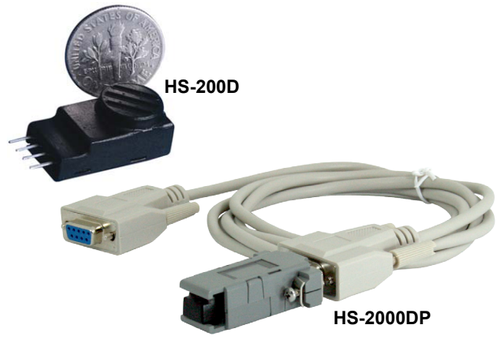
The innovative HS-2000D Humidity Sensor combines capacitive-polymer sensing technology with a novel measurement method, eliminating the need for temperature correction and calibration by the user. The sensor, which is calibrated at Precon before shipment, includes a thermistor and circuitry to correct for temperature and calculate the true relative humidity. The sensor provides both humidity and temperature outputs and is accurate to ± 2%.

The output of the HS-2000D is 9600 baud RS-232 ASCII text compatible with any PC or microprocessor with a serial port. The HS-2000D is powered through the serial port and does not require a separate power supply.

The HS-2000D covers a standard temperature range of 32° to 158°F (0° to 70°C).

The four-pin connection provides for easy installation or replacement in the field, reducing the overall cost to maintain large or complex systems.

The HS-2000DP preassembles a HS-2000D in a housing with a DB9 serial connection.



Features

- RH & Temperature Outputs
- Temperature Compensated
- Digital Output
- Factory Calibrated
- Accurate to ± 2%
- Field Replaceable
- Good stability
- Excellent Chemical Resistance
- Low cost

Typical Applications

▪ OEM Equipment ▪ Medical
▪ HVAC ▪ Pharmaceutical
▪ Computer Rooms ▪ Industrial
▪ Critical Space Monitoring
▪ Weather Metrology
▪ Humidifiers ▪ Data Logging
▪ Automation ▪ Refrigeration
▪ Environmental Chambers
▪ Laboratory ▪ Clean Rooms

MAXIMUM RATINGS

Operating Temperature	32° to 158°F (0° to 70°C)
Storage Temperature	-40° to 257°F (-40° to 125°C)
Operating Humidity Range	0-100 percent
Supply Voltage (from serial port)	±15 volts
Soldering Temperature	10 sec at 520°F (250°C)

SPECIFICATIONS

Humidity

Accuracy..... ±2.0% RH typical, 0-100% non-condensing (Note 1)

Linearity.....±0.5% RH

Hysteresis..... ±1.0% RH , maximum

Temperature Coefficient .....±0.008% RH / °C, maximum

Response Time .....25 sec. in slow moving air at 77°F (25°C)

Recovery Time (from condensation) ...10 seconds

Stability.....±0.5% RH / year

Temperature

Accuracy.....±0.40°C Typical (Note 2)

Response Time .....50 sec. in slow moving air

General

Power Requirements…

Voltage Supply .....5 – 12 volts, 32° to 158°F (0° to 70°C) (Note 3)

Operating Current...6 mA, maximum (Note 4)

Baud Rate 9600

Data Format .....ASCII Text:
8 data bits, no parity, 1 stop bit
H xx.x T±xx.x <CR>

Output Rate .....First data out within 250 milliseconds from power on, then every 1.4 ±0.3 seconds (Note 4)

Package ..... Four pin SIP with 0.100 inch lead spacing

Handling ..... ESD >4 KV, Human Body Model

PIN DIAGRAM

(Front View)

Pin # 1 2 3 4

Pin 1	TXD (Used as negative supply)
Pin 2	RTS (Used as positive supply)
Pin 3	RXD (Data OUT from Sensor)
Pin 4	Ground

Notes:

1. See Figure 2 on page 3
2. See Figure 3 on page 3
3. Refers to positive voltage supplied by attached serial port
4. Supply voltage equals 12 volts (maximum RS-232 level).

DATA SHEET HS-2000D
RH & TEMPERATURE SENSOR

FIG. 1 TYPICAL INSTALLATION

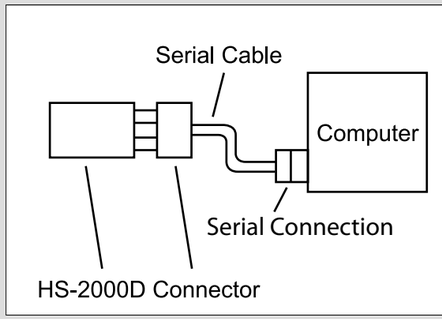


FIG. 2 RH ACCURACY

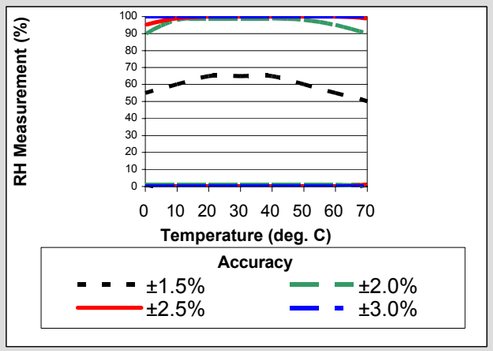
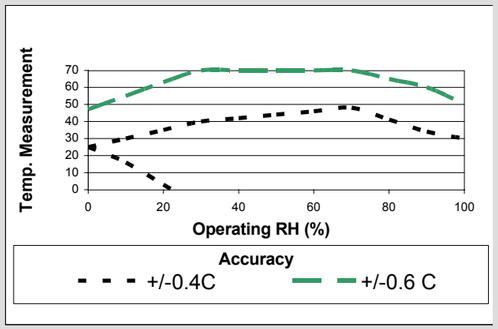
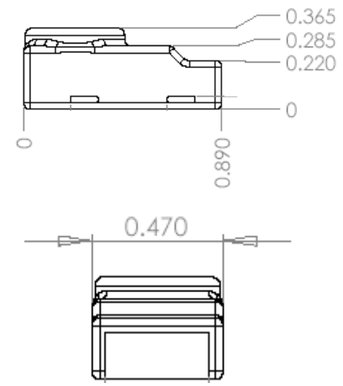


FIG. 2 TEMPERATURE ACCURACY



Dimensions



Tolerance on all dimensions ± 0.005 inch

Ordering Information

MODEL NUMBER	DESCRIPTION
HS-2000D	Relative humidity and temperature sensor: RS-232 compatible output; RH range: 0 to 100%; *Temperature range: 32° to 158°F (0° to 70°C)*
HS-2000DP	HS-2000D mounted in housing with DB9 serial connection.
HS-EKI	Evaluation kit includes DB9 connector prewired to 4 pin connector, serial cable and software.