

## TSPOT® Digital Flush Mount Temperature Sensor

## ATS2000D

### FEATURES

- **Digital I/O Via Dallas 1Wire™ Protocol (Ref:DS18S20)**
- **Wide Measurement Range:**
  - -40°F to +221°F
  - -40°C to +105°C
- **Accuracy: ±0.9°F (±0.5°C)**
- **Indoor/Outdoor Temperature Measurement**
- **May Network with 2 or 3 Wires Over Category 5 Cable**
- **Screw-Down Terminal Block Connector**
- **Snaps Into ¾" Hole in Drywall or Wood**
- **No Additional Hardware Required**

### APPLICATIONS

- **Zoning / Damper Control**
- **Indoor & Outdoor Temperature Measurement**
- **HVAC Monitoring and Control**
- **Energy Conservation**
- **Window Covering Control**

### DESCRIPTION

The ATS2000D TSPOT (pronounced "tee-spot") is a networkable digital temperature sensor that permits inconspicuous operation both indoors and out. It snaps easily into a ¾" hole in either drywall or wood. Small size, rugged construction and easy screw-down wire connections afford easy installation. The unobtrusive styling, high reliability and exceptional accuracy of the ATS2000D make it a logical choice for many HVAC control and home automation projects.

An installed ATS2000D appears as a low profile, one-inch diameter disk that is paintable. A labeled four-position, screw-down wire connector is positioned in back of the sensor body to allow easy hookup with a compatible home automation controller or data acquisition system. The heart of the ATS2000D is a unique, state-of-the-art, digital controller with many sophisticated capabilities. Protection circuitry has been employed to improve product reliability by preventing damage and "latch-up" due to electrostatic discharge and unexpected voltage transients.

Practically, one hundred ATS2000D sensors may be networked over a single cable, reducing both cable and installation costs. Low cost, unshielded, twisted pair cable such as Category 5 is recommended for proper operation. Typical advantages of digital communications include inherent noise immunity and power variation tolerance.

The ATS2000D is a low voltage device and should be adequately isolated from high voltage (110/220 Vac) wiring or devices. Please observe your local electrical code when installing low voltage devices.



ATS2000D – Uninstalled View

### OPERATING POWER

ATS2000D sensor networks may obtain operating power using either of two different methods. The method chosen may be limited by the capabilities of the user's bus controller.

The External power mode generally requires the use of a separate DC power supply and a network bus using three wires (i.e. power, ground & data).

A controller capable of operating in the Parasitic Power mode may be configured to allow selected ATS2000D sensors to derive power directly from the data wire, effectively eliminating the need for a separate power wire and may reduce the network bus to two wires.

Refer to the table below to establish the proper ATS2000D terminal connections for the desired mode.

### DIGITAL I/O

The **DQ** terminal available on the ATS2000D provides a direct, two-way digital interface to a compatible bus controller.

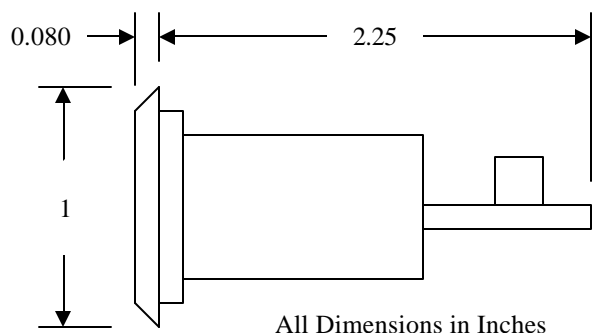
The ATS2000D bi-directional digital protocol is 100% compatible with the Dallas 1Wire™ LAN specification. It contains an 8-bit family code that identifies it as temperature sensing device and also contains a unique 48-bit serial number to allow each ATS2000D to be individually located on a network bus. An 8-bit cyclic redundancy code may be used to maintain error-free digital communication.

# Automated Environmental Systems, LLC

## ATS2000D TECHNICAL INFORMATION

TERM POSITION	NAME	INPUT/OUTPUT	OPERATING MODE	DESCRIPTION
1	+5V	Input	External Power Mode (VDD not connected)	Voltage Input for 3-Wire Bus Configuration <b>NOTE:</b> VDD must not be connected in this mode.
2	DQ	Input/Output	N/A	Bi-directional Address/Data Bus
3	GND	Input	N/A	Ground (Bus Ground)
4	VDD	Input	Parasitic Power Mode (+5V not connected)	Short to GND for 2-Wire Bus Configuration <b>NOTE:</b> +5V must not be connected in this mode.

PARAMETERS	MINIMUM	TYPICAL	MAXIMUM	UNITS
Temperature Measurement Range	-40.0		+221.0	°F
Accuracy from +14°F to +185°F			±0.9	°F
Accuracy (Full Temperature Measurement Range)			±3.6	°F
Absolute Maximum Operating Range	-40.0		+221.0	°F
Operating Voltage Range	+3.0	+5.0	+5.5	Vdc
Standby Current		+0.750	+1.0	mAdc
Operating Current		+1.0	+1.5	mAdc



## SUGGESTED INSTALLATION INSTRUCTIONS

1. Locate an appropriate site to install each ATS2000D and drill a 3/4" diameter hole using a paddle bit. For HVAC control, it is not recommended to install an ATS2000D where it may be exposed to temperature extremes such as in direct sunlight or near an air duct.
2. Run a Category 5, unshielded twisted pair cable between the first ATS2000D location and a controller or data acquisition system location. At this time a cable may also be run between the current ATS2000D location and another ATS2000D location.
3. Select a unique wire color and pattern (solid or stripe) to be connected to each terminal of the ATS2000D terminal block. For External Power mode assign wires as required to be individually connected to the **GND**, **DQ** and **+5V** terminals. For Parasitic Power mode assign wires as required to be individually connected to only the **GND** and **DQ** terminals. Note that in Parasitic Power mode, a wire jumper must be connected between the **VDD** and **GND** terminals of the ATS2000D.
4. At the ATS2000D location, strip about 3/16" of insulation from the ends of the selected wires, and then connect each wire to the appropriate terminal on the ATS2000D terminal block. At this time, the wires from a cable running to the another ATS2000D location may also be appropriately connected to the corresponding terminals of the first ATS2000D terminal block
5. Carefully press-fit the current ATS2000D into the predrilled 3/4" diameter hole
6. If more than one ATS2000D sensor is to be installed, the installer may wish to connect other sensors to the bus before proceeding to the next step.
7. At the controller location, strip about 3/16" of insulation from the ends of the selected wires, and then connect the **GND** wire to the ground or common terminal of the controller. Next, connect the **DQ** wire to the proper 1Wire™ data terminal of the controller. Note that the controller manufacturer may require that the controller be powered OFF before connecting or disconnecting wires.
8. For External Power mode only, connect the **+5V** wire to a preset DC power source with a regulated output between 3.0Vdc and 5.5Vdc. Note that the power supply common must be referenced (connected) to the controller common.

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27762 Antonio Parkway, #L1-610 • Ladera Ranch, California 92694 • 949-429-5967 • 949-429-5968 FAX • www.automated1.com