

TEMPPLATE® Decora Temperature & Light Sensor

ATP3000L

FEATURES

- **Analog Fahrenheit Temperature Sensor**
 - 2 Analog Outputs Scaled to +10mV/°F & +19.6mV/°F
 - Measurement Range: +32°F to +167°F
 - Typical Accuracy: ±1.2°F at +77°F
- **Analog Light Sensor Indicates Relative Light Level**
 - 2 Analog Outputs for Fast & Slow Response Times
 - Adjustable Light Measurement Range
- **Outputs Drive Any Cable, Including Category 5 Cable**
- **Mounts in Standard J-Box or Mud Ring**
- **Includes Hardware and Trim Plate**

APPLICATIONS

- **Zoning**
- **Indoor Temperature Measurement**
- **HVAC Monitoring and Control**
- **Energy Conservation**
- **Window Covering Control**

DESCRIPTION

The ATP3000L is an elegant wall plate designed to monitor indoor ambient temperature and relative light level. The attractive Decora styling, sturdy construction and high reliability and exceptional repeatability of the ATP3000L make it a logical choice for HVAC control and home automation projects. The ATP3000L contains a low profile temperature probe and an ambient light sensor. Screw-down wire connections afford easy installation.

Operation of the ATP3000L is extremely simple. Just connect the +V and COM terminals to a DC power supply with a regulated output voltage between +5Vdc and +30Vdc. Take care to observe the proper polarity. Once powered, the ATP3000L produces four linearly scaled analog signals proportional to temperature and relative ambient light when referenced to the COM terminal. All output signals are voltages between zero and +5V. These signals may be conveyed over more than 1000 feet of cable to the input of a compatible home automation controller or data acquisition system.

The ATP3000H is designed to drive most types of shielded and unshielded twisted pair cables such as category 4 and category 5. Shielded cable is recommended for electrically “noisy” environments. Be sure to connect the cable shield to earth ground or power supply common near the home automation controller or data acquisition system only.

The ATP3000L 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.

ANALOG OUTPUTS

The T10 output available on the ATP3000L provides a direct reading of temperature using a common digital voltmeter. For example, a



ATP3000L – Front View

temperature reading of 75.3°F produces an analog signal on T10 of $(0.010V/°F \times 75.3°F) = 0.753V$. By simply moving the decimal point two places to the right (i.e. multiplying by 100) the proper value of 75.3°F may be derived.

The T20 output available on the ATP3000L offers increased resolution when used with a home automation controller or data acquisition system employing an 8-bit ADC (Analog-to-Digital Converter). An ADC's resolution determines the amount of analog signal change required to cause a corresponding change in the digital number available to the receiving system. Scaling the T20 output signal to 19.6mV/°F allows an 8-bit ADC to resolve a 1°F change in measured temperature. The digital number at the output of the ADC may be then be read directly. For example, a reading of 100 at the output of an ADC monitoring a temperature sensor will directly indicate a value of 100 degrees.

LIGHT LEVEL MONITORING

The ATP3000L allows relative measurement of ambient light levels (RLL) for the purpose of determining light related events. Two light level output signals are provided on the ATP3000L to allow the monitoring of both fast (<1 second) and slow (>15 second) changes in the ambient light level. The fast response output may be used to quickly detect events such as turning on a lamp in a dark room or opening a window covering. The slow response output may be used to detect slowly varying light levels such as sunrise or sunset, while averaging out faster events such as intermittent shadows from clouds, etc. Fast and slow outputs may be monitored simultaneously to help identify special event signatures. An adjustment on the rear of the sensor increases or decreases the dynamic range of the light sensor to help account for the vast difference between indoor and outdoor light levels.

TECHNICAL INFORMATION

TABLE 1: ATP3000L six-position screw-down wire connector

TERMINAL NUMBER	SIGNAL NAME	INPUT/OUTPUT	SCALE FACTOR	DESCRIPTION
1	+V	Input	N/A	Voltage wrt the COM terminal (+5Vdc to +30Vdc max)
2	T10	Output	10.0mV/°F	Temperature Signal (direct reading)
3	T20	Output	19.6mV/°F	Temperature Signal (scaled for 8-bit ADC)
4	LFR	Output	N/A	Light Level Signal, Fast Response
5	LSR	Output	N/A	Light Level Signal, Slow Response
6	COM	Input	N/A	Common (Power Supply Common)

TABLE 2: ATP3000L SPECIFICATIONS

PARAMETERS	MINIMUM	TYPICAL	MAXIMUM
Temperature Measurement Range	0 °F		+167.0 °F
Temperature Accuracy	±3.0 °F	±1.2 °F (@77 °F)	
T10 Output Signal Range (+10.0 mV/°F Scale Factor)	0 V		+1.670 V
T20 Output Signal Range (+19.6 mV/°F Scale Factor)	0 V		+3.273 V
Relative Light Level Measurement Range	0%		+100%
LFR Output Response Time		1 second	
LSR Output Response Time		15 seconds	
Recommended Operating Temperature Range	+32.0 °F		+167.0 °F
Operating Voltage	+5.0 Vdc	+12.0Vdc	+30.0Vdc
Operating Current		+1.5 mAdc	+2.5 mAdc

ATP3000L INSTALLATION INSTRUCTIONS

1. Locate an appropriate site to install the ATP3000L and install a single gang junction box or mud ring for mounting. For HVAC control, it is not recommended to install the ATP3000L where it may be exposed to temperature extremes such as direct sunlight or an air duct.
2. Run cable containing at least six individually insulated wires (four wires if only one temperature signal and one relative light level signal will be monitored) between the ATP3000L location and a controller or data acquisition system location. Shielded cable may be used.
3. Select a unique wire color and pattern (solid or striped) to be connected to each terminal of the ATP3000L terminal block. Assign wires as required to be individually connected to the +V, COM, T20, T10, LFR and LSR terminals on the ATP3000L terminal block.
4. At the ATP3000L 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 ATP3000L terminal block.
5. At the controller location, strip about 3/16" of insulation from the ends of the selected wires, and then connect the COM wire to the ground or common terminal of the controller's ADC (analog-to-digital converter). Next, connect the T10 wire, T20 wire or both individually, to available ADC inputs on the controller. Next, connect the LFR wire, LSR wire or both individually, to available ADC inputs on the controller. Note that the controller manufacturer may require that the controller be powered OFF before connecting or disconnecting wires.
6. Connect the +V wire to a preset DC power supply with a regulated output between 5.0Vdc and 30.0Vdc. Note that the power supply common must be referenced (connected) to the controller's ADC common.
7. Connect the cable shield, if any, to earth ground or alternately to the power supply common terminal.
8. Install the ATP3000L in a junction box or mud ring, and then install the wall plate.

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