DALLAS SEMICONDUCTOR **MAXIM**

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APPLICATION NOTE 104

Minimalist Temperature Control Demo

The Minimalist Temperature Control Demo is an example of a 1-Wire® HVAC-style thermostat. It comes with a ready-to-use printed circuit board populated with a 1-Wire temperature sensor, along with a PC-to-1-Wire adapter and software to control the device and read the temperature.

Features

- Direct-to-digital, direct-to-PC instrumentation with graphical user interface demo
- Ready to use temperature control demonstration including piezo-sensor for sensing of mechanical activity and LED to simulate opto-isolators
- Features minimalist sensor chips and 1-Wire® line-powered MicroLAN™ networking technique
- Self-configuring TMEX-based software automatically identifies devices and assigns communication port
- Includes DS1820 1-Wire Thermometer and DS2407 Addressable Switch as a Sensor/Actuator

Description

The Minimalist Temperature Control Demo is a closed loop 1-Wire MicroLAN control system. It consists of a ready to use printed circuit board (**Figure 1**), a cable with two RJ-11 connectors and a disk with software. In addition to this, the demo requires the DS9097 COM Port Adapter
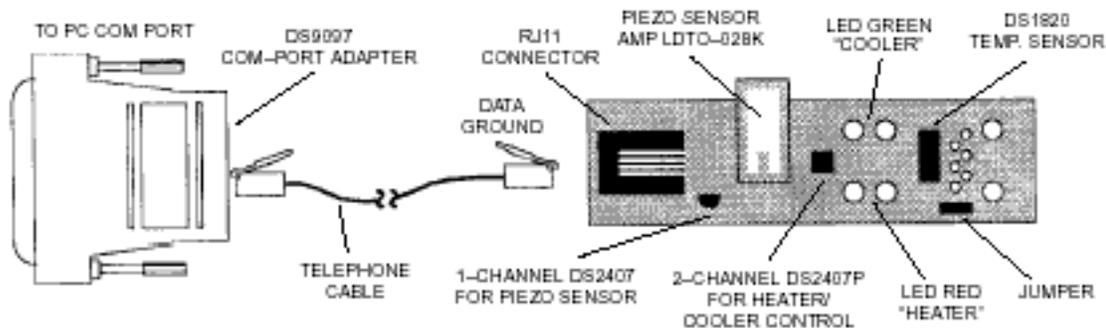

Figure 1. Temperature Control Circuit Board Description

To run the demo, connect the circuit board to the DS9097 adapter using the RJ-11 cable and plug the adapter into the RS232 serial communication port of your computer. Load the demo disk into the 3 1/2" disk drive and start the program TEMPCONT.EXE.

Software Operation

The demo program comes up with the Temperature Control Graphical User Interface Tab (**Figure 2**). The actual temperature is displayed in the center of the window. The value is read from the DS1820 Thermometer and interpolated to the 0.1°C or °F resolution. A short beep marks every new reading. On startup, the heater and cooler trip points are close to the actual temperature and the heater is running. One may change the trip points up or down by clicking on the arrows. For this demo, the heater trip point must be at least 1.0°C or 1.8°F lower

than the cooler trip point. The demonstration assumes that one warms up the DS1820 by touching it with a finger. This will raise its temperature and eventually switch off the heater, and, after some time, switch on the cooler.
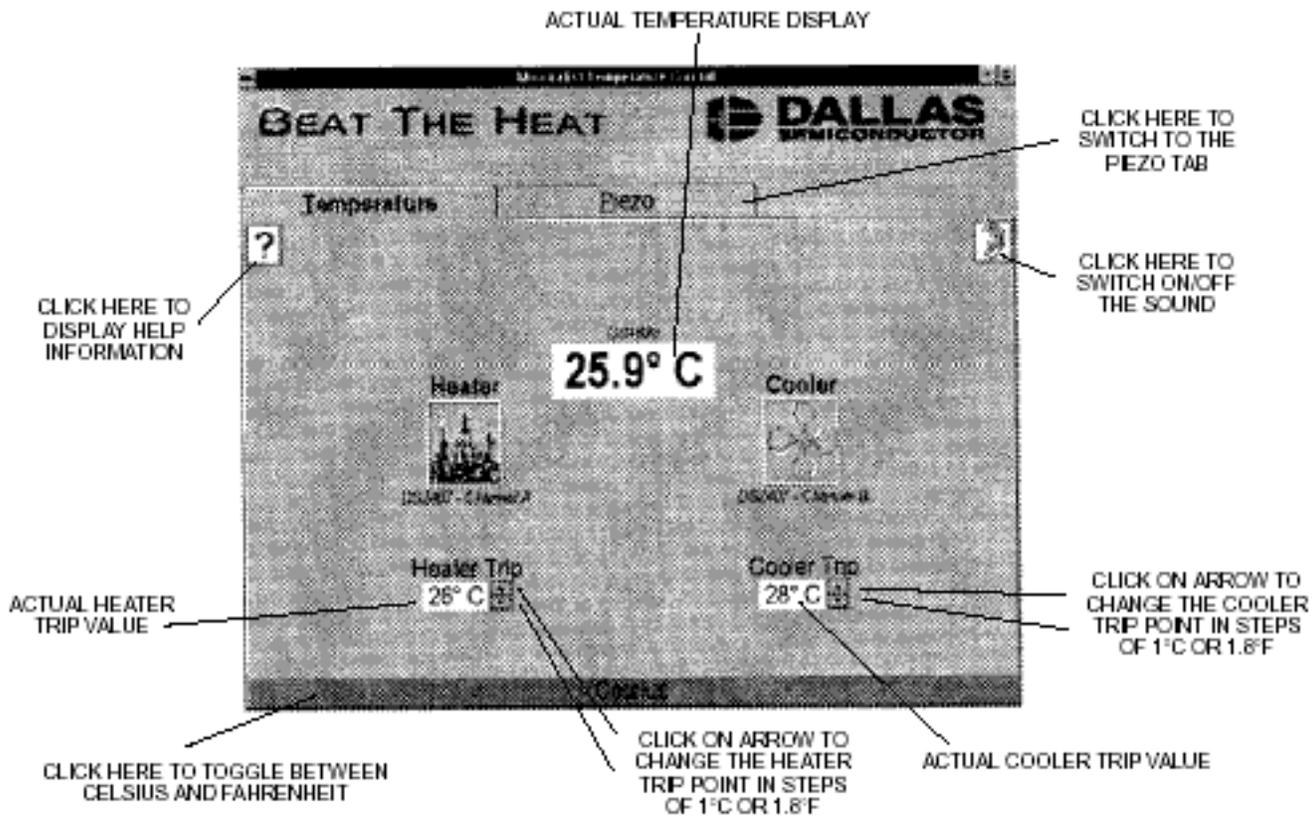

Figure 2. Graphical User Interface Temperature Control Tab

Movement of the Piezo-Sensor will result in the program temporarily switching to the Piezo-Activity Tab (**Figure 3**), where the Dallas Skyline appears every time the piezo-sensor registers activity. To prevent the program from automatically switching back to the Temperature Control Tab, press P. To return back to temperature control, press T.
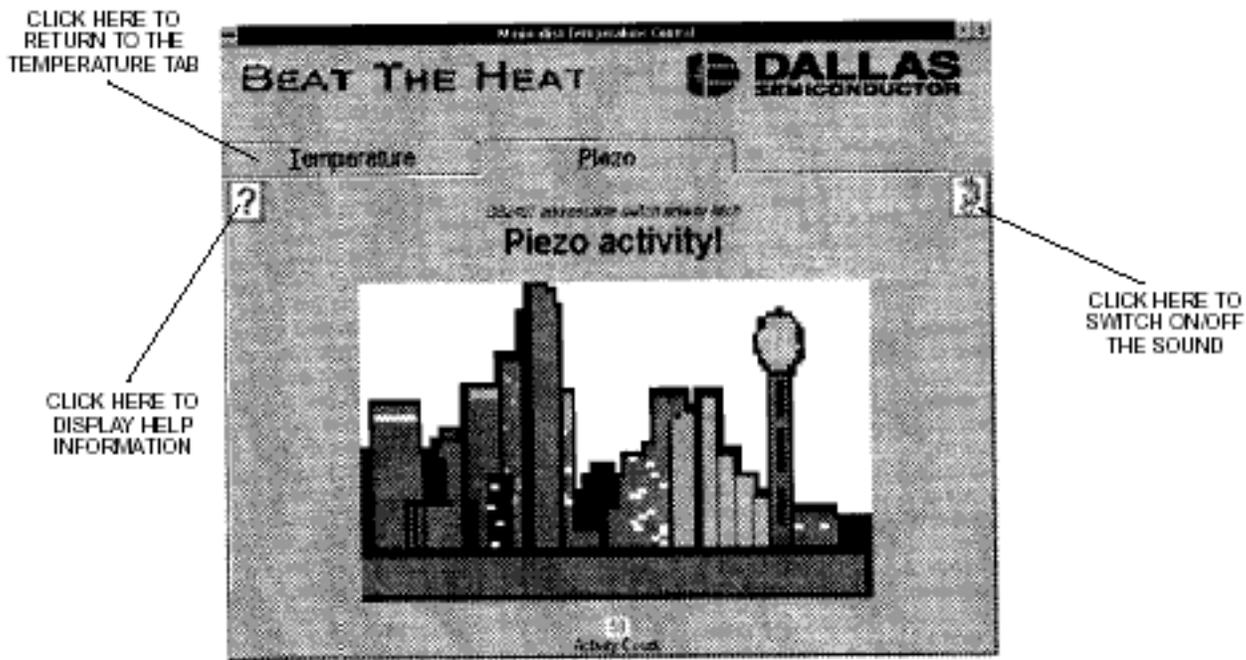
CLICK HERE TO
RETURN TO THE
TEMPERATURE TAB

CLICK HERE TO
DISPLAY HELP
INFORMATION

BEAT THE HEAT

DALLAS
SEMICONDUCTOR

Temperature   Piezo

Piezo activity!

CLICK HERE TO
SWITCH ON/OFF
THE SOUND

Activity Count

Figure 3. Graphical User Interface Piezo-Activity tab

More information about the demo program is obtained by clicking on the question mark or by displaying the README.TXT file found on the demo disk.

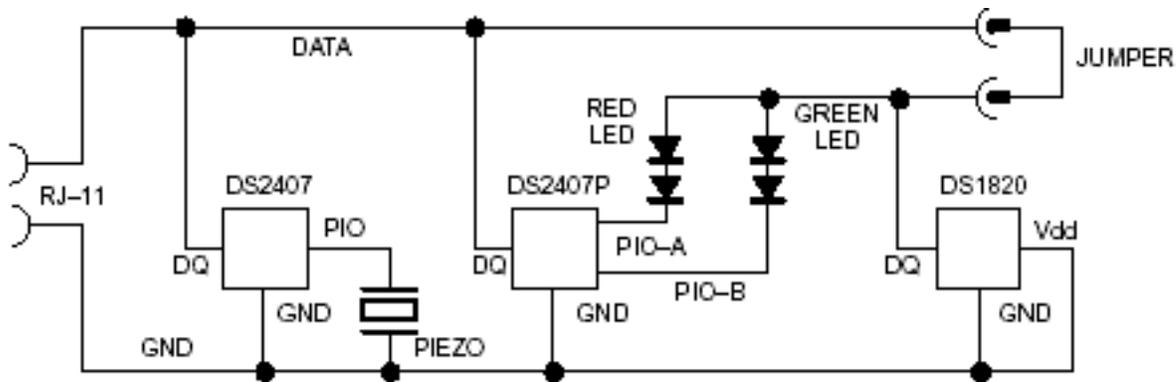The software will not work if the jumper is removed from the circuit board.

Figure 4. Demo Board Circuit Diagram

Table 1. Minimalist Temperature Control Demo Contents

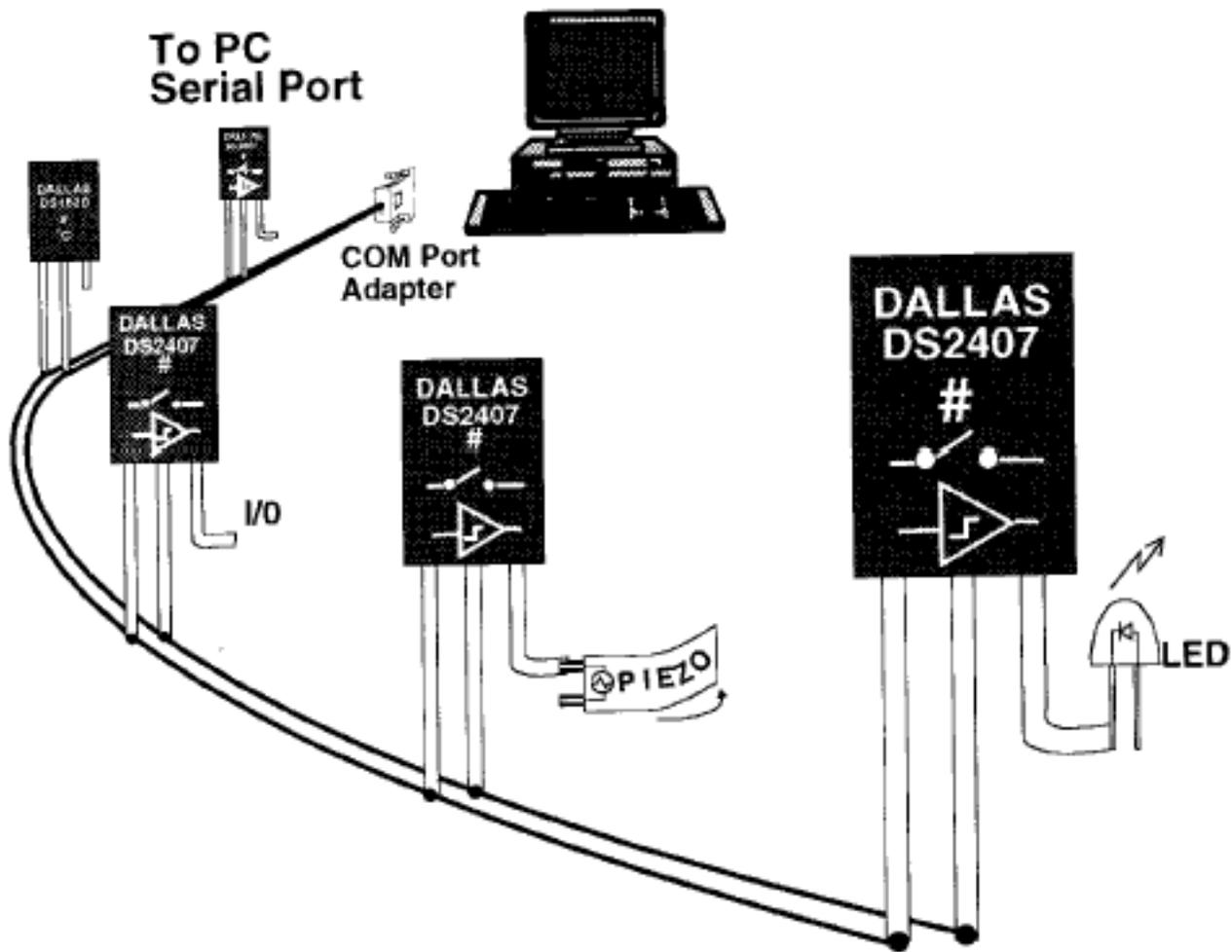| KIT PARTS LIST		SPECIAL DEVICES ON THE DEMO BOARD		
DESCRIPTION	QUANTITY	PART NUMBER	DISCRIPTION	QUANTITY
Demo Board	1	DS1820	Direct–To–Digital Temperature Sensor	1
RJ–11 Cable	1	DS2407	one–channel Addressable Switch	1
DS9097 COM– Port Adapter	1	DS2407P	two–channel Addressable Switch	1
3 1/2" Demo Disk	1	LTDO–028K	AMP Piezo Sensor for info call AMP at (610) 666–3545	1

Figure 5. 1-Wire Line-Powered MicroLAN

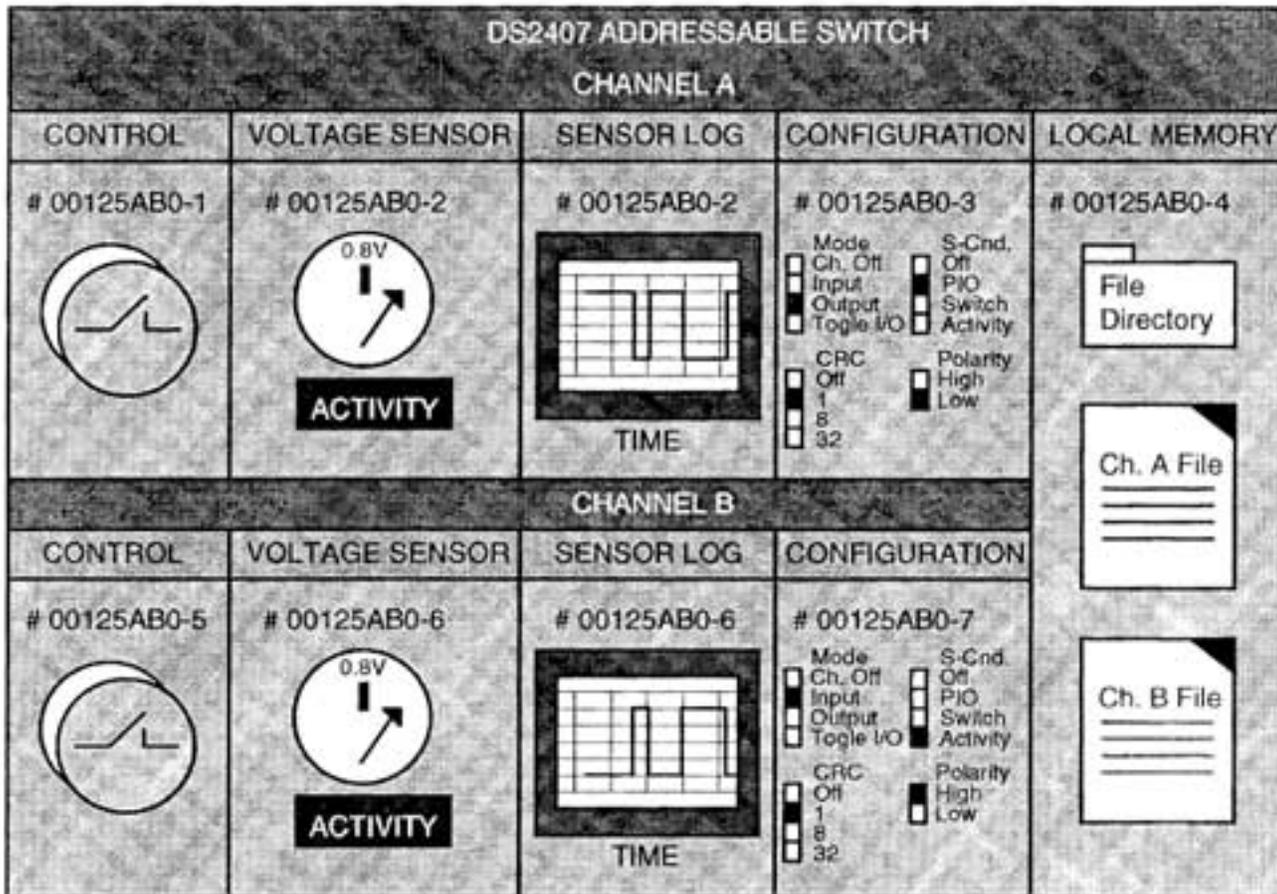*Figure 6. DS2407 Addressable Switch Control Panel Representation of all Resources as Viewed from PC*

Application Note 104: http://www.maxim-ic.com/an104

More Information
For technical questions and support: http://www.maxim-ic.com/support
For samples: http://www.maxim-ic.com/samples
Other questions and comments: http://www.maxim-ic.com/contact

Related Parts

DS1820:   QuickView -- Full (PDF) Data Sheet

DS18S20:   QuickView -- Full (PDF) Data Sheet -- Free Samples

DS2406:   QuickView -- Full (PDF) Data Sheet -- Free Samples

DS2407:   QuickView -- Full (PDF) Data Sheet

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