ON Semiconductor

Test Procedure for the ADT7476EBZEVB Evaluation Board

OBJECTIVE

The evaluation board allows all the input and output functions of the ADT7476 to be demonstrated. The software allows control and monitoring of the ADT7476's internal registers. Using the evaluation board and its accompanying software, the ADT7476 can be interfaced to any personal computer running Windows XP or Windows 2000 via the USB port.

EVALUATION BOARD HARDWARE

The evaluation board contains:

- An ADT7476 device
- Two remote transistors for temperature sensing
- Two 5V fans and fan drive circuitry
- 12V fan connectors
- Electronic configuration switches
- Indicator LEDs
- On-board heaters (allows demonstration of fan response over temperature)
- USB interface circuitry
- External 12V power connectors (required for fans and heaters, the ADT7476 device is powered from the USB port)
- Potentiometers for voltage measurement
- Push button for THERM assertion.

QUICK GUIDE TO SETTING UP AND USING THE ADT7476 EVALUATION KIT.

➢ Install software before connecting the ADT7476 evaluation board to the USB port. Software is available on the enclosed CD.

➢ The ADT7476 evaluation board can be powered from the USB port. A separate 12V power supply is required to run the fans.

➢ Open the ADT74XX software Start>All Programs> ON Semiconductor> ADT74XX EvaluationSoftware> ADT74XX Evaluation Software. The ADT74XX software, once started, looks for the device it is about to communicate with. The following screens appear.
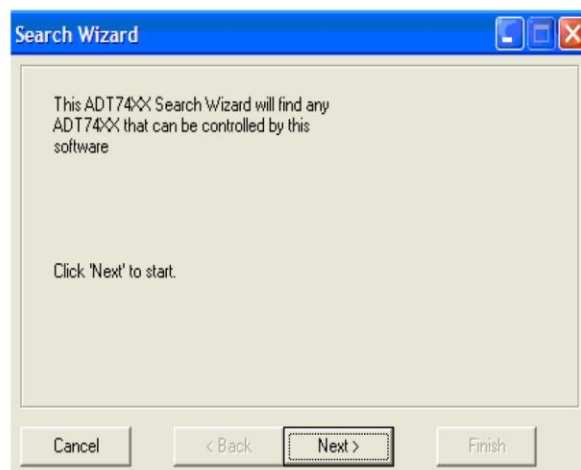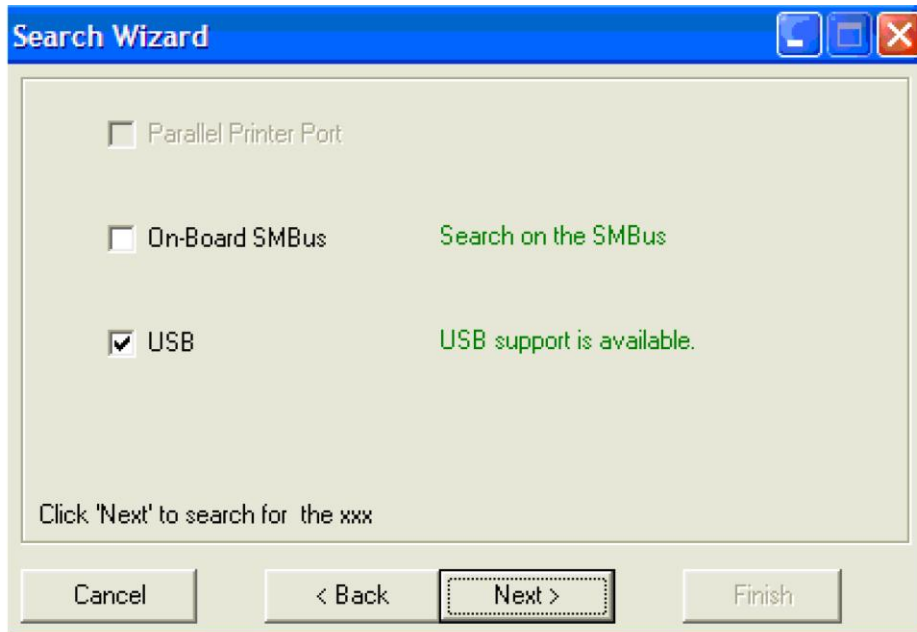

Figure 1. Finding the device. Click the 'Next' button.

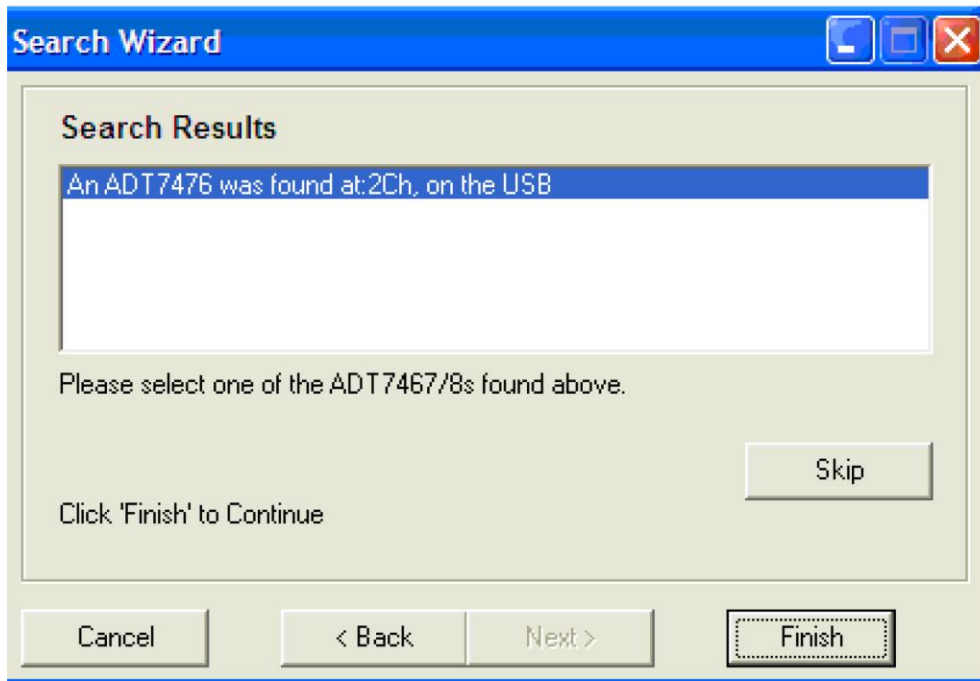Figure 2. Click 'Next' , this searches the USB for and ADT74XX devices.

Figure 3. Select the device from the results and click 'Finish'

➢ Once this is done the software starts up. To open the graphing window go to the main toolbar, >Main >Visual Display.
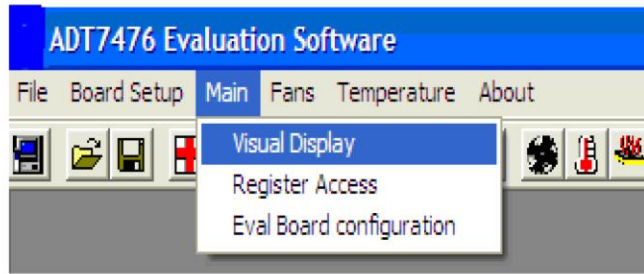

Figure 4. Opening Graphing window

➢ The graphing window displays the temperature of the local and remote sensors, the fan RPM and the PWM %duty cycle for each of the PWM channels. It also displays the different voltage readings taken from the board.
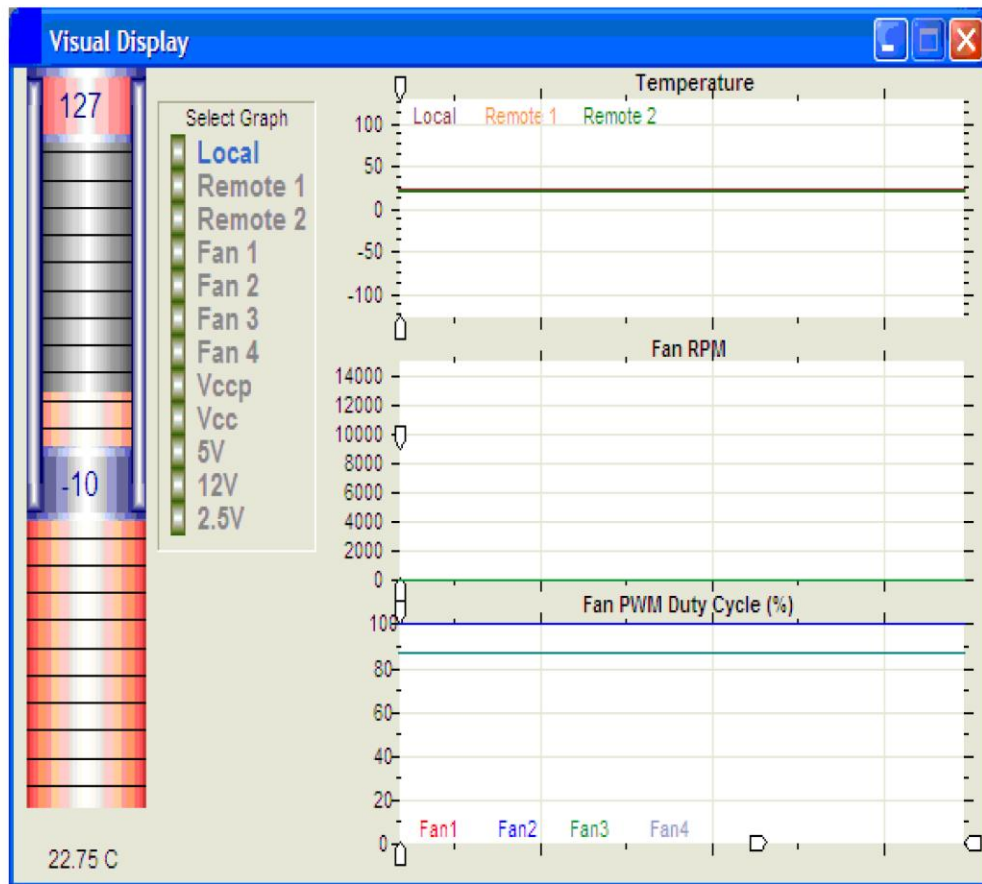

Figure 5. Graphing Window

➢ Limits for: Local, Remote 1, Remote 2, Fan 1, Fan 2, Fan 3, Fan 4, Vccp, Vcc, 5V, 12V and 2.5V channels can be adjusted using the slider bars in the graph. The upper limit (red) and lower limit (blue) are adjusted by clicking and dragging the slider up or down. The Status will change from green to red on an out of limit event for the corresponding channel.

➢ Some pins on the ADT7476 share functionality (pins 10, 14, and 24) To change the function of these pins you need to open the Eval Board Configuration window. On the main toolbar click 'Main'> 'Eval Board Configuration'
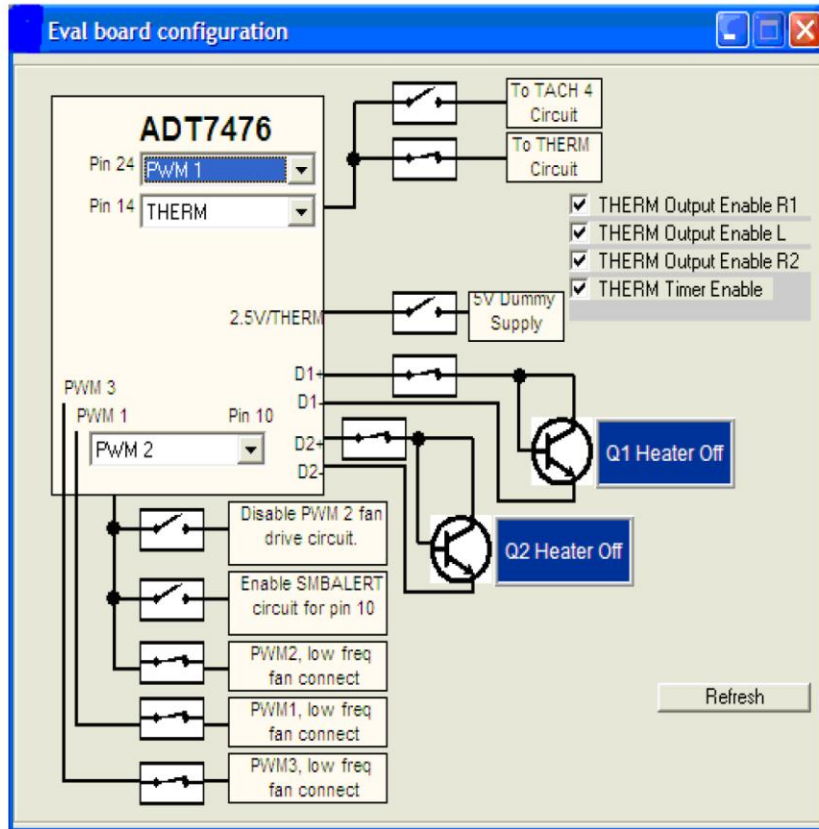
Figure 6. Eval Board Configuration Window

➢ The onboard heaters can be turned on and off in this same window by clicking the appropriate heater (Q1 or Q2). In figure 6 heater Q1 is turned on.
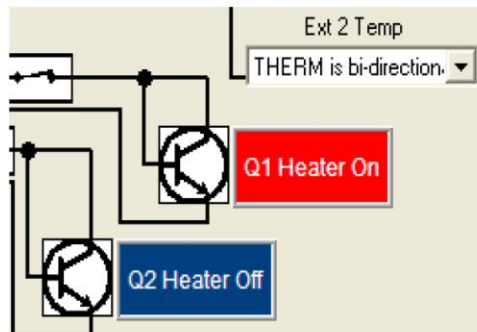
Figure 7. Onboard heater control.

AUTOMATIC FAN CONTROL:

Automatic fan control can be configured by opening the automatic fan control window. The fans may be configured to be controlled by any temperature and the associated settings (T_{MIN} T_{RANGE}, PWM_{MIN}, PWM_{MAX} etc…) can be changed in this window.

(Note: slide bars should be dragged to the right to increase the value and to the left to decrease the value.)

> 'Max PWM1 Duty Cycle' changes the maximum speed that the fan can run at while the temperature reading is below the Therm limit.

> 'Min PWM1 Duty Cycle' changes the minimum speed that the fan can run at while the temperature reading is above the TMIN limit.

> 'TMIN' indicates at what temperature at which the fan will turn on. At this temperature the fans run at the value of 'Min PWM1 Duty Cycle'

> 'T THERM' is the temperature at which the fan goes to full speed. (Most likely a critical temperature).

> 'Temp Hyst' is the range the temperature reading must reduce below before the fan will decrease its speed.

> 'TRange' defines the slope of the line from 'Min PWM1 Duty Cycle' to 'Max PWM1 Duty Cycle'.
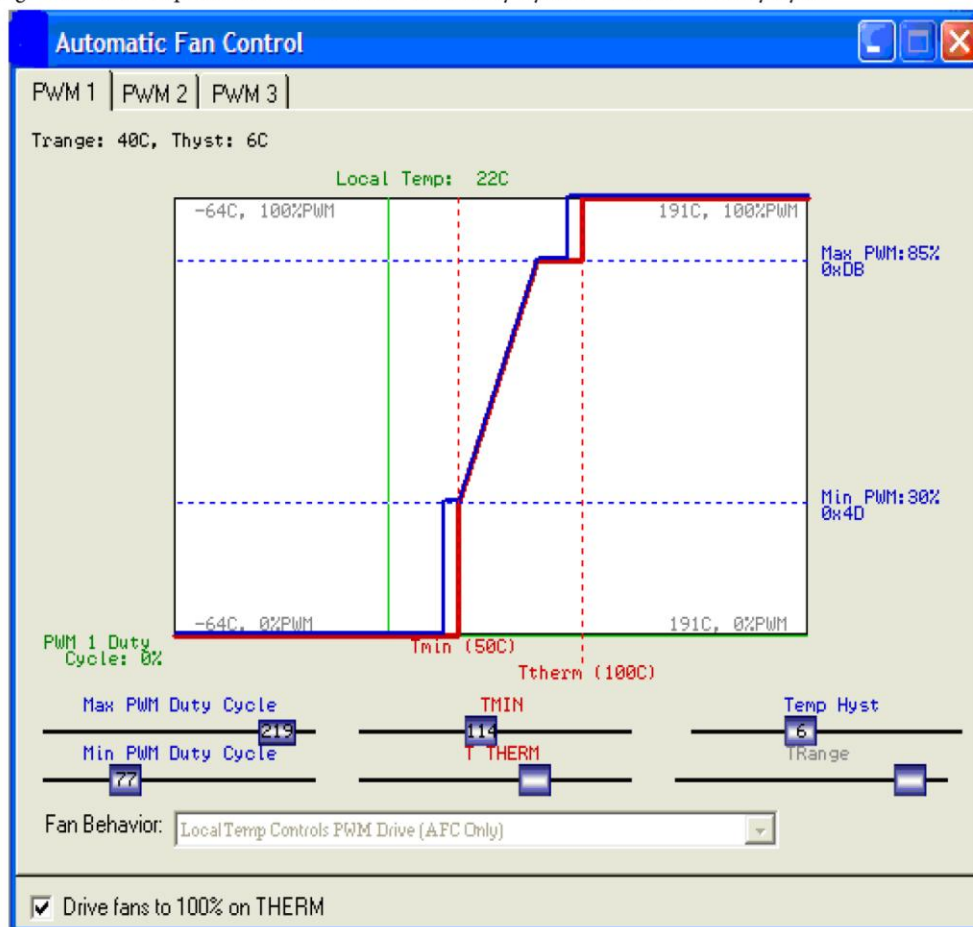

Figure 8. Automatic Fan Control Window

VOLTAGE MONITORING:

The ADT7476 can monitor four external voltage channels. It can also measure it's own supply voltage, Vcc. Pin 20 to Pin 23 can measure 5V, 12V and 2.5V supplies, and the processor core voltage Vccp (0V to 3V input). The Vcc supply voltage measurement is carried out through the Vcc pin (Pin 4). The 2.5 V input can be used to monitor a chipset supply voltage in computer systems. The voltage inputs can be changed by adjusting the potietometers on the eval board.