) interrupt the PIC on its
ıgrammable setpoint, T_{OS}
ıysteresis so that the tem-
ıT threshold before rising

ı shown in Figure 9-12b.
cessary to insert a delay
PIC's commands to the

'write" message string is
ınd byte loads the Pointer
ı), or it can continue with
.4b). Once the pointer has
T_{OS}, or T_{HYST} (illustrated

ıtage can be taken of the
case the interactions with
ıated in Figure 9-14c.

ılogy supplies *nonvolatile*
ıles stored in an EEPROM
Some instruments use an
ıtrument is actually custom
se an EEPROM to allow a
ı complicated setup proce-
al very different measure-
user, providing backup of

An EEPROM with an I^{2}C serial interface such as Microchip Technology's 24LC01B provides designers with a convenient solution to a need for nonvolatile data storage. It holds 128 bytes of data. It is packaged in a tiny eight-pin DIP or surface-mount package. It requires only a +5-V supply and will operate on the "fast-mode" (400 kbit/s) I^{2}C bus. It draws less than 3 mA of supply current during programming, 1 mA during reading, and 0.1 mA during standby. It times its own write cycle and automatically erases a byte before writing into it. A block of up to 8 bytes can be written to the chip at one time and the chip will program them all simultaneously in less than 10 ms (our mainline looptime). The manufacturer guarantees successful writes for up to 10,000,000 erase/write cycles and data retention beyond 200 years over an operating temperature range of 0°C to +70°C (or −40°C to +85°C for the industrial version).

The device with its interface circuit is illustrated in Figure 9-15. The WP (write protect) pin permits a manufacturer to program a part with calibration constants (with WP low) and then to permit only reads thereafter (with WP tied high). In contrast to the other I^{2}C devices discussed in this chapter, this part has the single, fixed 7-bit address

$$1010xxx$$

That is, any read from or write to the slave address B'1010000' or B'1010001' or . . . or B'1010111' will access the EEPROM chip.
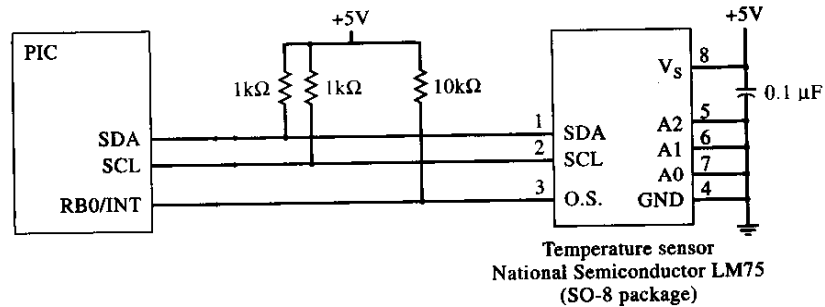
(a) Circuit
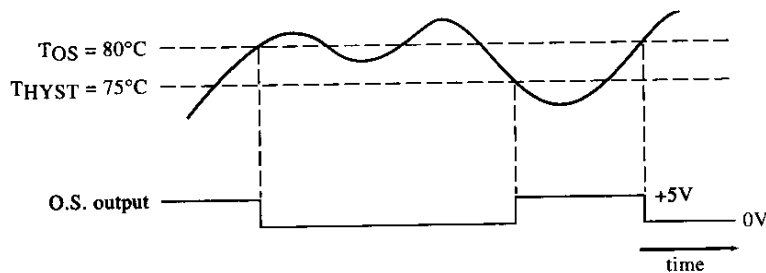
(b) Default performance of the O.S. (Overtemperature-Shutdown) output

Figure 9-12 LM75 temperature inputs