DigitalDoc2 ®

Thermal Sensor-Fan Monitor

The DigitalDoc2® is more than just a thermometer, its built-in microprocessor automatically activates your computer's cooling fans, the instant they are needed.

Second-Generation DigitalDoc2 User's Manual

The second-generation thermal sensing system of the DigitalDoc2 family represents the most intelligent method for protecting your computer systems against heat-related problems. Installation, settings, and operation can be easily mastered. With DigitalDoc2 , you can monitor the temperature of up to eight different devices within your system and activate cooling fans for needed remedy.

There are three models in the second-generation DigitalDoc2 family:
MP-TC02A with 2 sensors and one 40-mm fan (controls an additional fan);
MP-TC04A with 4 sensors and one 40-mm fan (controls 3 additional fans); and
MP-TC08A with 8 sensors and one 40-mm fan (controls 3 additional fans).

Each channel features an independent temperature sensor controlled by its own adjustable set point. This allows maximum flexibility for monitoring the temperatures in your system. A 40 mm x 40 mm fan is included in the front panel of each sensor unit and is controlled by sensor channel number 1 (Figure 1). This fan has a removable, easily cleaned filter. A diagnostic function allows comprehensive analysis of temperatures and fan operation in your system.
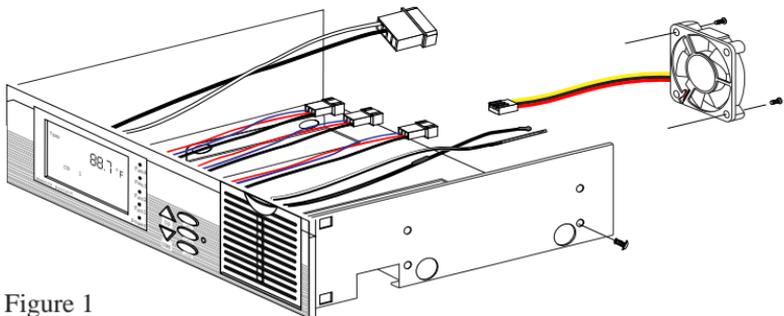
Figure 1

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Quick Reference for DigitalDoc2

1. Check actual temperature and fan status

Just press SCAN. DigitalDoc2 will automatically show actual temperatures for each channel sequentially followed by the status of the fans.

2. Check temperature settings

Press SET an appropriate number of times until the desired channel number appears. The corresponding reading is the pre-set temperature for that channel.

3. Adjust temperature settings

Check the temperature settings as above. When you reach the desired channel, press UP to increase the set point, or press DOWN to lower the set point.

4. Force on all fans simultaneously in case of emergency

Just press FORCE and all fans will start to turn simultaneously.

5. Force on a single fan.

Press SET an appropriate number of times to make the desired fan number appear. Press FORCE and the corresponding fan will start to turn.

6. Enable/Disable mode switch for fans

Press the SET button an appropriate number of times to reach the desired fan channel. Either En or Dis will be displayed. Pressing either the UP or DOWN buttons will switch between the enable (En) and disable (Dis) modes.

(Please refer to user's manual for more comprehensive descriptions.)

Introduction

After you install this unit and set the temperature for each channel, you can be assured that your system has the ultimate protection from heat-related problems. The second generation DigitalDoc2 is designed for ease of operation. If the temperature of any channel reaches the set point, then the fan controlled by that channel is turned on automatically. If the temperature continues to rise to 3 C above the set point, then a warning beeper sounds to alert you of the problem. At the same time, the channel number will blink on the display panel to indicate where the problem is. The warning beeper will also sound if there is a problem with the fan, such as irregular speed, or if the fan gets disconnected.

An additional feature of this unit is a scan function. Pressing the SCAN button will cause the unit display to cycle through the various channels and show the current temperature registered for each sensor, as well as the fan speed for each fan in operation.

Packing list:

MP-TC02A
Screws (2 types - 5 pcs each).......... 10 pcs
Thermal tape................................. 2 pcs
Sensors .... 2 pcs

MP-TC04A
Screws (2 types - 5 pcs each).......... 10 pcs
Thermal tape................................. 4 pcs
Sensors .... 4 pcs

MP-TC08A
Screws (2 types - 5 pcs each).......... 10 pcs
Thermal tape................................. 8 pcs
Sensors .... 8 pcs
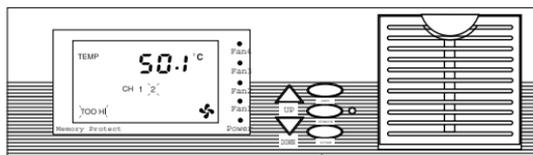
Figure 2
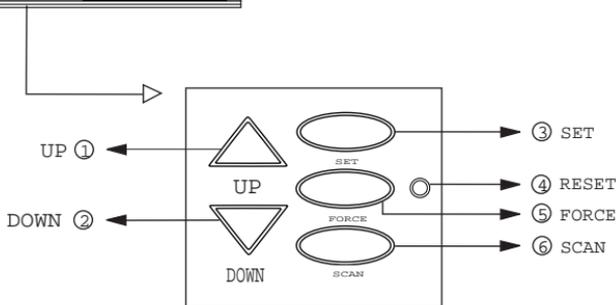
Figure 2 shows the front panel of the DigitalDoc2 unit. The information needed to control and operate the sensors is shown by the LCD display. The buttons used to make and change settings include:

UP (1) and DOWN (2): for changing various settings

SET (3): for changing functions and channels

RESET (4): for resetting unit (by inserting the end of a paper clip into the hole)

FORCE (5): for controlling fan function

SCAN (6): for diagnostic purposes

Installation

Each unit comes with ten mounting screws, five each of two kinds (See PACKING LIST on page 2.). This allows installation in a broad range of systems. The number of connectors on the back of the unit varies with the model.

MP-TC02A has 1 fan and 2 sensor connectors

MP-TC04A has 3 fan and 4 sensor connectors

MP-TC08A has 3 fan and 8 sensor connectors
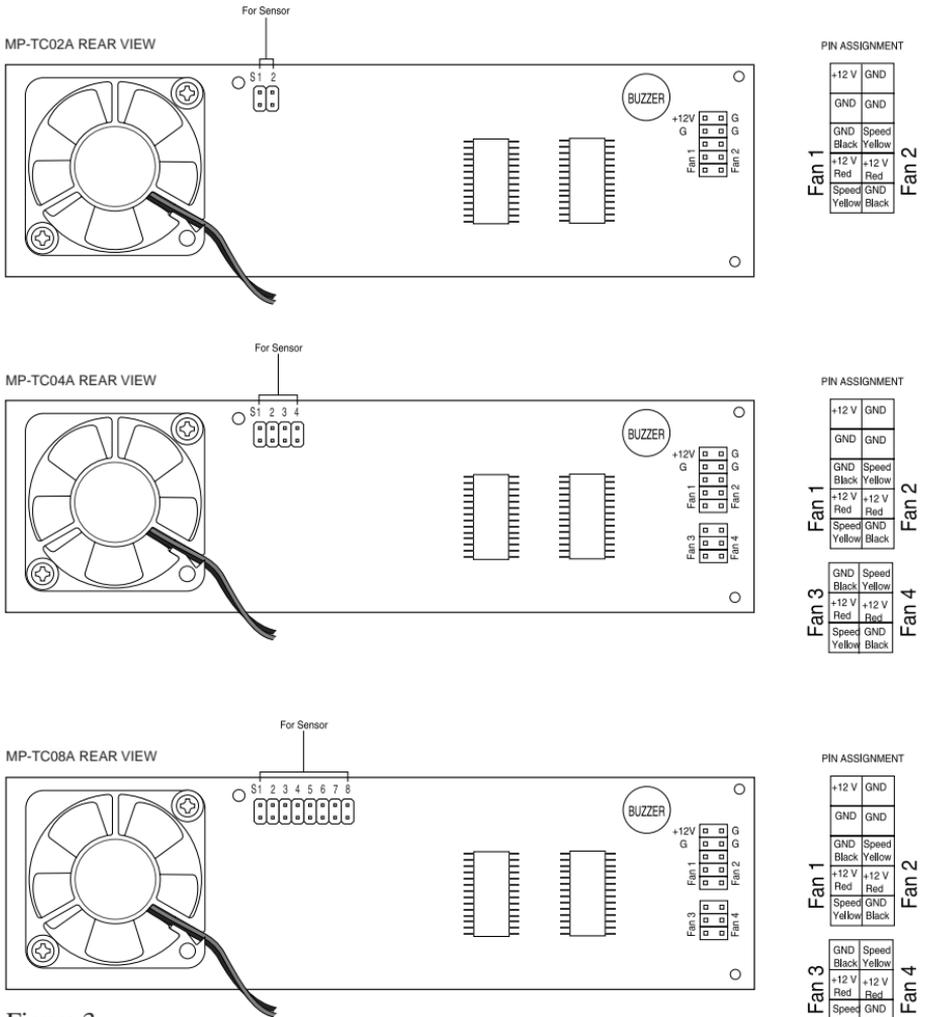
Figure 3

Figure 3 shows the inside of the unit with the various connectors. Each sensor cable and fan connector is marked with the channel to which it belongs.

Settings
Default Settings

The unit is factory-set to the following default values: all sensor channels preset to 50 C, and fan 1 is enabled. This means that the unit will monitor the performance of fan 1, and sound a beeper if it detects a disconnection or irregular fan speed. See below for procedures for changing these settings for your particular application.

Checking settings

To scroll through the different channel settings, press the SET button an appropriate number of times. The number of the current channel is displayed. There are up to eight sensor channels (depending on the model) and four fan channels, in order from sensor channels 1 to 8, followed by fan channels 1 to 4, then scrolling back to channel 1 again, and so on.

When scrolling through the sensor channels, the temperature setting is displayed for each sensor in turn. The fan channel indicates if the power to a fan is turned on (by the fan icon), and whether the fan is in the enable or disable mode.

Use the SCAN button (see below) to read current measured temperatures and fan speeds.

Changing from Celsius to Fahrenheit

1) Press the SET button once. (The letter F or C following the temperature reading should be blinking.)

2) Pressing either the UP or DOWN button toggles between F and C.

3) After you have changed to either F or C, then the unit will automatically return to normal operation after 5 seconds with the new setting.

This simultaneously changes the temperature units for all channels.

Adjusting the temperature settings
For channel 1:

1) Pressing the SET button two times. opens the set mode for sensor channel 1. On the LCD display, SET and 1 are displayed (Figure4-Ⓐ), and the temperature setting is blinking.
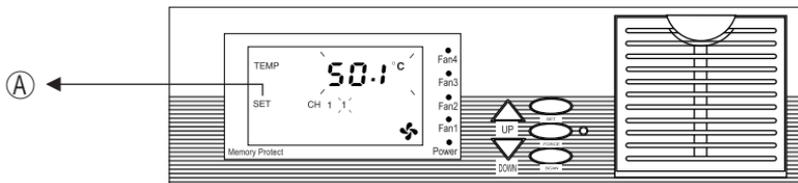
Figure 4

2) Next either press the UP button to increase the set point, or press DOWN to lower the set point.

3) After you have set the temperature, the unit will automatically return to normal operation after 5 seconds, and the new set point will be stored for channel 1.

For other channels:

1) Press the SET button two times to enter the set mode for sensor channel 1.

2) Continuing to press the SET button will cycle through the various sensor channels (followed by the fan channels).

3) When you reach the sensor channel you want, press the UP button to increase the set point, or DOWN to lower the set point.

Operation of Unit
Buzzer control

After unit is installed and programmed, you know that the most comprehensive temperature-monitoring process available is protecting your system. When the buzzer sounds, you will need to determine the source of the trouble, and this allows you the opportunity to correct any situation before it results in loss of data, or damage to your system.

A sounding buzzer indicates either excessive temperatures, or a problem with a fan. When you press any of the buttons on the display, you turn off the buzzer. Then you can follow the procedures below to determine the cause of the disturbance. The unit will automatically resume operation 25 minutes after you turn off the buzzer. You should have had time in this interval to correct the problem. If the buzzer sounds again when the unit resumes processing, pressing any button permanently turns off the warning function in this channel. You can override this by resetting the unit (see page 10)

Fan operation

The unit can control up to four fans, one for each of four sensor channels. Sensor channel 1 controls the 40 mm front panel fan. The unit monitors fan operation and will sound a buzzer if the fan speed is too high, too low, the fan ceases operation, or becomes disconnected. This buzzer can be manually turned off by disabling the buzzer. Also, fans can be manually turned on to operate whenever the unit is turned on. These procedures are described in this section.

Checking the operation of the fans

By pressing the SET button an appropriate number of times, you will reach the four fan channels (1 to 4). The LCD will show both SET (Figure 5-Ⓑ) meaning you can change the enable/disable setting, and the fan icon (Figure 5-Ⓒ) if power is turned on to that fan.
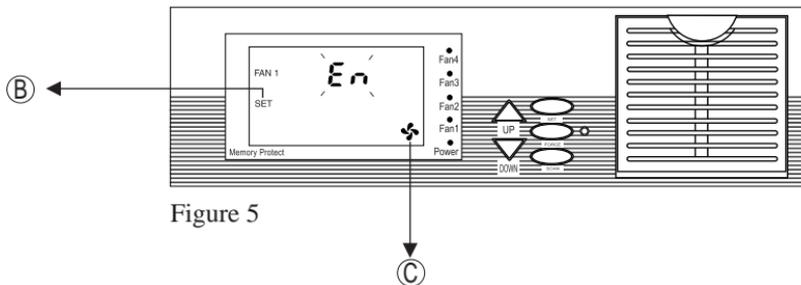
Figure 5

Manual fan operation

In some circumstances, you may wish to have one or more fans running whenever the unit is turned on. To manually turn on a fan:

1) Scroll through the different channels (sensor channels followed by fan channels) by pressing the SET button an appropriate number of times. When SET (Figure 6-Ⓑ) and FAN1 are displayed, then you are in the fan channels. The number of the fan channel is displayed to the right of FAN1.

2) When you reach the desired fan channel, press the FORCE button. This turns the power on to that fan, and is indicated by a blinking fan icon (Figure 5-Ⓒ). Power will be supplied to this fan channel whenever the unit is turned on.

Fan buzzer operation: enable/disable modes

The unit monitors fan operation. If the unit senses that the fan speed is too high, too low, or the fan is otherwise malfunctioning, then the warning beeper will sound. You have the option of turning off this beeper function by the following procedure:

1) Scroll through the different channels by pressing the SET button (Figure 7-Ⓒ).

2) When you reach the desired fan channel (Figure 7-Ⓐ), the display will show either "ɛn" for enable, or "dɪ5" for disabled. The enable mode allows the buzzer to sound if there is a problem with the fan. The disable mode turns off the buzzer.

3) To choose between enable and disable modes, press either the UP or DOWN buttons. After finishing this setting, the unit will automatically return to normal operation after 5 seconds.

Figure 6

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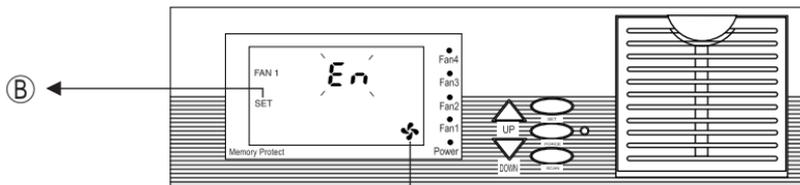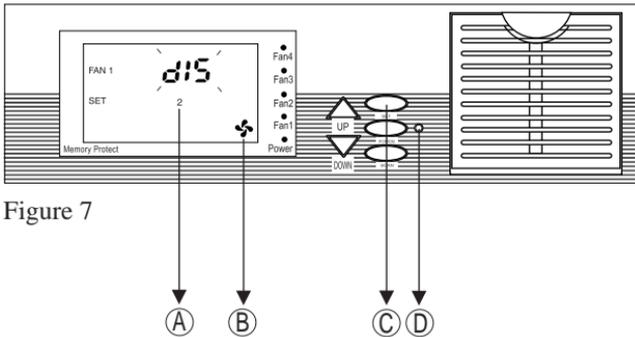
Figure 7

Troubleshooting

If you discover that the buzzer has been activated, then you need to find the source of the problem. If a sensor is indicating an excessive temperature in that channel, then the channel number will be flashing on the LCD panel. If the buzzer has activated because of a problem with a fan, the LED of the fan with a problem will be flashing.

The unit contains a microprocessor, and if there is a glitch in the power while you are changing settings, there is a possibility that the microprocessor will be in a floating state. This is indicated by a display of all zeros. To correct this situation, you do not need to turn off the system. You can simply reset the unit by the following procedure:

1) Insert a thin object (such as the end of a paper clip) into the reset hole (Figure 7- Ⓓ) just to the right of the FORCE button.

2) While holding the pin in the reset hole, hold down the SET button (Figure 7- Ⓒ).

3) First release the pin in the reset hole, then after about a second, release the SET button. Now the unit has been reset to the default values.

4) Follow the appropriate instructions described above to reprogram the unit.
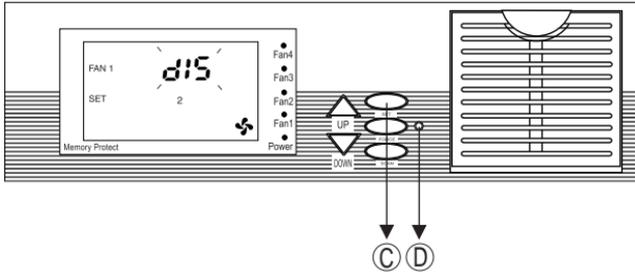
You may notice at some time that an orange fan LED is blinking. This may indicate that the temperature in that channel is within the tolerance around the set point, and the microprocessor is deciding whether to turn the fan on. This is normal, but does indicate that the temperature is nearing the set-point level. It may also mean that the fan is malfunctioning. You can press the SCAN button to check the status of all sensors and fans.

Sensor display panel
a. Green LED on indicates 12 V connected and normal operation.
b. Orange LED on indicates fan in operation.
c. Orange LED flashing indicates a problem with that particular fan.

Fan Size	Part Number
40 x 40	FN-4040
60 x 60	FN-6060
80 x 80	FN-8080
90 x 90	FN-9090
120 x 120	FN-120120

¡Ðf you would like to order three-pin fans, please refer to the following table for part numbers based on fan size in millimeters.

¡Ðf you would rather use your existing two-pin fans, then you will need a two-to-three-pin converter. These converter cables can be ordered from us, and the part number is CB-3020.

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