

**MRDT-50
Differential Blackbody
Operating Manual
Rev. 5**



1. Specification

Slew rate:		+0.10°C/s, -0.08°C/s
Stability:		0.005°C rms ($\pm 0.01^\circ\text{C}$ p-p)
Emissivity:		>0.95
Max / Min Temp.:		65°C / 5°C
Set Point Resolution:		0.01 °C
Differential Accuracy:		0.01 °C
Dimensions	Blackbody:	4" x 4" x 6"
	Controller :	7" x 4.5" x 10.5"
	Face:	2.1" x 2.1"
Weight	Blackbody:	3.5 lbs.
	Controller :	4.3 lbs.
Environment:		60 °C to -20 °C
Power In:		240/120 VAC, 40 W

2. Parts List

QTY	ITEM
1	Blackbody head
1	Controller
1	Single Bar Target
	Pitch: 0.428"
1	Multi Bar Target
	Pitch: 0.02"
	0.17"
	0.048"
	0.122"
1	USB Cord
1	Power Cord
1	Software CD

3. System Requirements

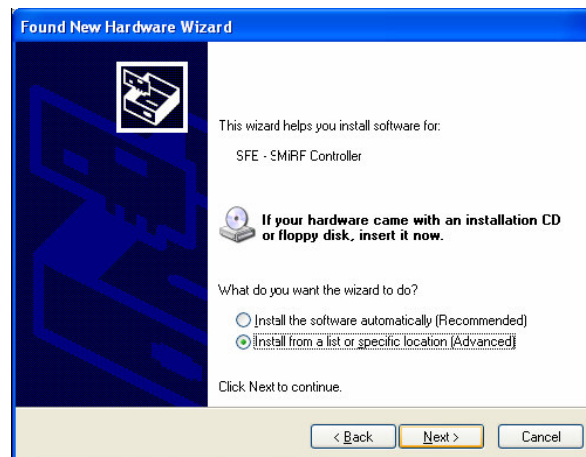
Windows XP SP2 or Higher
 Microsoft .Net 2.0 Software (Copy Provided on CD)

4. Installing Software

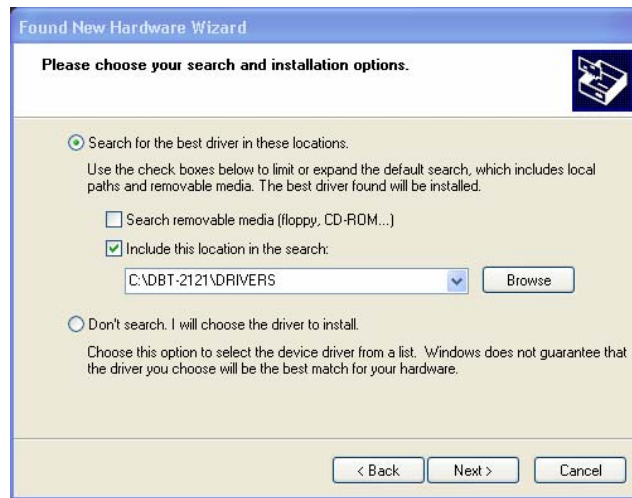
Copy the folder MRDT-50 from the Installation CD on to the root drive, (e.g., C:\DBT-2121). Plug the blackbody head cable (RJ45 Cable) into the controller box. Plug the controller box into an AC outlet and the computer USB port, using the cables provided. The *Found New Hardware Wizard* will pop up:



This is the new XP Service Pack 2 Wizard. Yours may look slightly different. For XP, select, *No, not this time* and click *Next*.

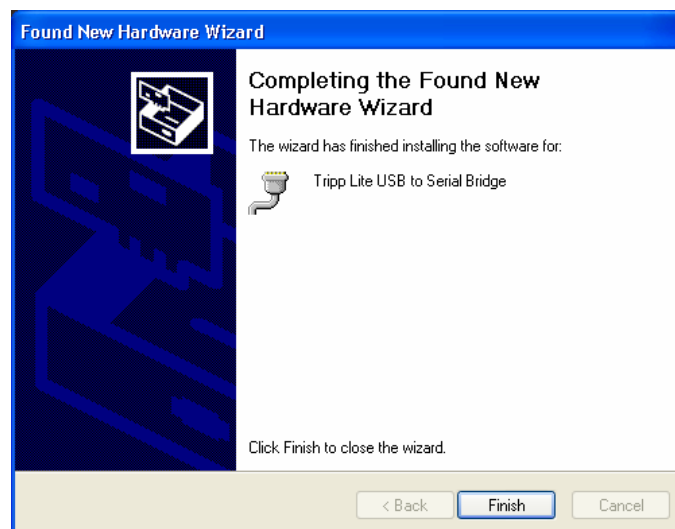


When asked to search automatically or from a specific location, Select *Install from a list or a specific location (Advanced)*



Now you will need to tell the computer where the drivers are located. Navigate to the directory C:\DBT-2121\Drivers to locate the files. Windows may warn you that the driver is not verified. This is ok, click *Continue Anyway*.

Continue anyway

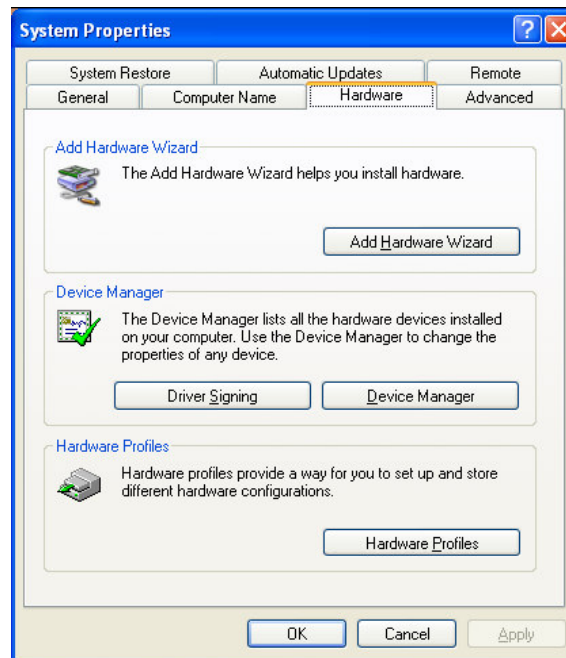


Installation complete!

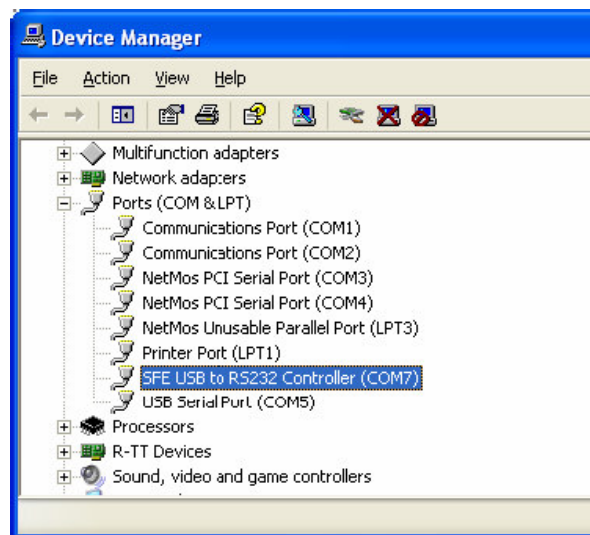
COM Port Configuration

Locating active Com Port

- 1) To create a connection to the blackbody, you will need to determine the com port into which it is installed. Right click on 'My computer' and click on *Properties*. This will open the *System Properties* window:



- 2) Click on the Hardware tab and then Device Manager button. This will open the Device Manager:



- 3) Scroll down to "Ports" and open the branch. In this example, the "Tripp Lite USB to Serial Bridge" is located on COM7.

Assigning Com Port in Configuration File

- 4) Navigate to directory where blackbody software is installed
- 5) Locate file **C:\DBT-2121\Blackbodycontroller.exe.config**
- 6) Right click on file and select "Open with..."
- 7) Choose Notepad program to open file
- 8) Once file is open, locate and change **value="COM3"** to value specified in Device Manager. In this example: **value="COM7"**.
- 9) Save and close the file.

5. Operating the Blackbody

Once the software is installed and the hardware set-up, turn the blackbody power on with the switch on the front of the controller box.

Start the blackbody control program by double clicking on the program icon in the blackbody folder, (double click C:\DBT-2121\ BlackBodyController.exe).

The software operates in two modes, "fixed" and "differential".

Fixed Mode

This mode is used without the bar target in place. It sets the blackbody radiator plate to a fixed temperature.

To operate the blackbody in fixed mode:

1. In the lower "Set Temperature" box, click the "Fixed" radio button
2. Type in the desired blackbody temperature.
3. Click the "Set" button.

The display shows the radiator plate's temperature in green numbers. The small numbers show the set temperature. The power indicates how hard the blackbody is working to achieve the set temperature. When the power is steady, and near or at zero, the blackbody is stable.



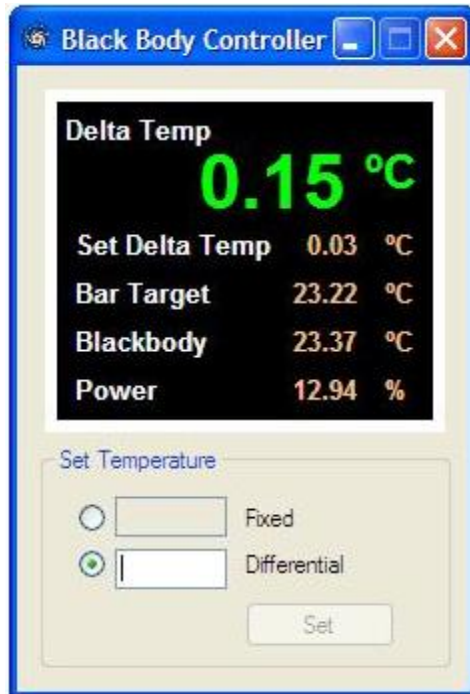
Differential Mode

This mode is used with the bar target in place. It sets the blackbody radiator plate to maintain a relative temperature difference between the target plate and the blackbody radiator.

To operate the blackbody in differential mode:

1. In the lower “Set Temperature” box, click the “Differential” radio button
2. Enter the differential temperature desired
3. Click the “Set” button

The display shows the difference in temperature between the radiator plate and the bar target plate in green numbers. The small numbers show the set differential temperature, the actual temperature of the bar target and the actual temperature of the blackbody radiator. The power indicates how hard the blackbody is working to achieve the set temperature. When the power is steady, and near or at zero, the blackbody is stable.



Changing Bar Target

To change the bar target:

1. Unplug AC power from the unit
2. Remove top cover of the blackbody head (remove four screws securing the top cover)
3. Loosen the six side screws and one bottom screw clamping the bar target to the front flange, and remove the two center top screws.
4. Slide out the bar target, and exchange the target or use without.
5. Re-assemble

Note:

Once set up, the computer may be removed, and the blackbody will continue to operate at the last settings.

To prevent water condensation on the radiator, avoid operating the blackbody below the dew point.