FlashPoint™ Infrared Temperature Gauge

Instruction Manual

The DuraTrax® FlashPoint™ Temperature Gauge is a non-contact infrared thermometer. Specifically designed for use with R/C engines, batteries, motors, sealing irons and heat guns, simply aim the temperature gauge at the target and press the measurement button to quickly and easily display the surface temperature! The distance to target ratio is 1:1, and therefore the temperature gauge should be positioned as close to the target as possible.

SPECIFICATIONS

Temperature Range:	-27 to +428 degrees F [-33 to +220°C]
Display Resolution:	0.1°F or C (switchable)
Response Time:	1 second
Infrared Accuracy:	+/- 2% of reading
Field of View:	1:1 optics ratio
Emissivity:	0.95 default - adjustable 0.01 to 1 emissivity
Battery Life:	40 hours continuous use (auto power off after 15 seconds)
Battery Type:	CR2032 lithium primary (not rechargeable)
Display Type:	custom LCD
Dimensions:	0.7 x 1.5 x 2.7" [18 x 37 x 68mm]
Weight:	1.13 oz. including battery [32g]

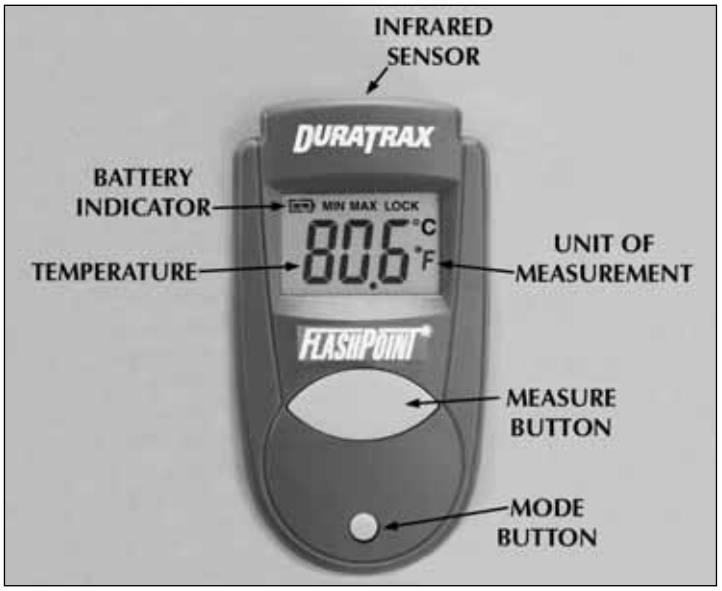
SPECIAL FEATURES

- Push-button start
- Extremely small and lightweight, for easy portability anywhere.
- Reads temperatures in degrees Fahrenheit (F) or Celsius (C).
- Very wide temperature range of -27 to +428 degrees F [-33 to +220°C].
- Large, custom designed LCD for easy viewing and a built-in battery power indicator.
- Fast 1 second response time.
- Highly accurate to within +/-2% of reading.
- Easy push-button control of setup and measurement.
- Includes a 15 second auto-off timer to prevent accidental draining of battery.
- Common non-rechargeable lithium battery included.
- Handy wrist-strap included.

IMPORTANT PRECAUTIONS

- **Electromagnetic / Radio Frequency Interference:** Readings may be affected if the unit is operated within a radio frequency electromagnetic field strength of approximately 3 volts per meter, but the performance of the instrument will not be permanently affected. Keep this gauge at least 6 inches away from R/C transmitters to avoid radio frequency interference.
- Avoid keeping the temperature gauge too close for long periods of time to objects that continuously generate high heat (like a hot plate), which can cause overheating of the temperature gauge.
- Do not allow water or moisture to come in contact with the gauge.
- Do not replace the battery with one other than a “CR2032 lithium” non-rechargeable battery.

SETTING ADJUSTMENTS & TAKING TEMPERATURE MEASUREMENTS



Sometimes it is easier to accurately measure the temperature of an object by physically attaching a thermometer or thermocouple to it. However, it can often be difficult or inconvenient to do so. Sometimes, it is only necessary to see the large heat patterns of an object, rather than measuring a temperature at a very precise location on the device. In these cases, measuring an object’s heat radiation with an infrared temperature gauge is a good solution.

To get started using the FlashPoint Infrared Temperature Gauge, first press the large “MEASURE” button. The first display will show the unit of measure of “°F” for fahrenheit or “°C” for celsius. Follow these steps to change the unit of measure, to adjust other settings, or to begin measuring temperatures:

Note: FlashPoint will automatically shut off if a command has not been given within approximately 15 seconds. This feature protects the on-board battery from accidentally becoming drained (this option can be disabled as described in point #4 below). To re-start, simply press the "MEASURE" button again.

1. FAHRENHEIT OR CELSIUS: Proceed as follows only to **change** the "°F" or "°C" unit of measure that is shown on screen (if the unit of measure is o.k., skip to the next step). First, turn on the gauge by pressing the "MEASURE" button, then press the "MODE" button four times. The "°C" or "°F" symbol will flash. Simply press the "MEASURE" button, and the unit of measure shown on screen will change.

2. MEASURING TEMPERATURES: There are two ways to immediately begin measuring temperatures. Point the sensor located on the top end of the gauge directly at the object to be measured, and do one of the following:

a. Press the "MEASURE" button once for an **instantaneous** temperature reading to be shown on-screen.
b. Press and **hold** the "MEASURE" button to read temperatures continually. The temperature on-screen will be updated every 1 second or so while the button is being held. Letting go of the button will cause the last reading to remain on-screen.

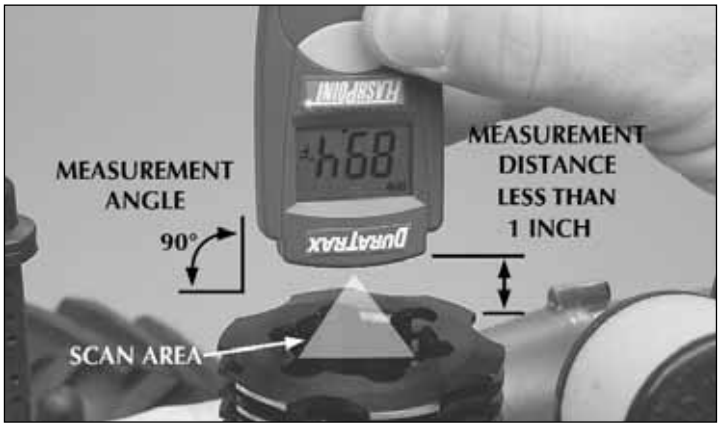
3. STORING MINIMUM AND MAXIMUM TEMPERATURES: FlashPoint can temporarily store minimum or maximum temperatures. Turn the unit on by pressing the "MEASURE" button. Then, press the "MODE" button once for the minimum function or twice for maximum. The appropriate "MIN" or "MAX" icon will flash in the top of the screen. Then press the "MEASURE" button to confirm the selected mode.

a. Minimum temperatures: point the sensor to the object being measured, and press and HOLD the "MEASURE" button and FlashPoint will display and hold the coolest or "MIN" temperature that is observed while the button is being held.
b. Maximum temperatures. Point the sensor to the object being measured, and press and HOLD the "MEASURE" button and FlashPoint will display and hold the hottest or "MAX" temperature that is observed while the button is being held.
c. **Note:** FlashPoint will only store the minimum or maximum temperatures respectively until the unit is powered off. FlashPoint will reset all data at this time.

4. TIMER LOCKOUT MODE: FlashPoint's 15 second automatic shut-off timer can be disabled allowing the temperature gauge to function continuously for up to 60 minutes if desired. This extended operation function is called the LOCK MODE, and is particularly useful for continuous monitoring of temperatures. To activate the lock mode, press the "MEASURE" button to turn the gauge on. Then, press the "MODE" button three times whereby the "LOCK" icon will flash. Then, press the "MEASURE" button to enable the "LOCK" mode. FlashPoint will continuously display and update temperatures for up to 60 minutes, or until the "MEASURE" button is pressed again which disables the "LOCK" mode.

Note: Using the "LOCK" mode will cause the on-board battery to drain more quickly.

5. MEASURING TIPS: For the most accurate measurements, follow these tips when using the FlashPoint temperature gauge:



a. Make sure the gauge's sensor is as close to the object as possible, preferably within 1 inch, so that the infrared sensor's field of view is fully focused on the object. Attempting to read temperatures with the gauge further away from the object will result in less accurate readings.
b. Always point the sensor directly at the object being measured. Try not to have the gauge tilted at a different angle in relation to the object being measured.
c. It may be a good idea to re-measure the temperature of an object at a slightly different location on the object, to reconfirm the accuracy of the reading.
d. Try to avoid allowing sunlight or other artificial light from beaming in-between the gauge and object being measured, as heat from such light could skew actual readings. For the same reason, also try to prevent wind from blowing in-between the gauge and object being measured.
e. Generally, higher air or ambient temperatures lend to more accurate readings. Cold ambient temperatures can result in inaccurate readings. Ambient or air temperature refers to the area around the infrared temperature gauge, the higher the temperature the more accurate the reading, the lower the temperature the less accurate the readings.

APPLICATIONS FOR R/C USAGE

The FlashPoint can be used to measure temperature on various types of R/C equipment such as engines, heat guns, motors, battery packs, battery chargers, and sealing irons. Manufacturers specify an operating temperature at which each

engine type should run. Setting up your engine to operate near this specified temperature is a key to long lasting operation from your engine, and FlashPoint is the perfect tool to help you do this job! Engines which run too hot can suffer too much wear and tear, and have a shortened lifespan. Engines which run too cold are often not running at optimum efficiency. Adjusting different parameters such as carb set-up, air flow, fuel type and/or oil content can directly affect engine temperature. Refer to your engine's instruction manual to determine the proper adjustment methods for your engine, and monitor engine temperature with FlashPoint for dialing-in the optimum overall performance level for your engine.

Using FlashPoint can help to eliminate these problems:

Engines	**Covering**
Fuel too lean	Wrinkles
Binding equipment	Covering does not adhere
Bad fuel	Holes in covering
Oil content too low	
Nitro content too high	

Many external forces can cause errors in how temperatures are measured by infrared temperature gauges such as FlashPoint. This is because infrared temperature gauges do not make physical contact with the heated object. In fact, it is not unusual for the temperature measurement of an infrared temperature gauge to be different than that of a thermometer which makes physical contact with the heated object - even when they are measuring the exact same point! There is a way to adjust how infrared temperature gauges read temperatures that can make up for these unwanted external forces, and make temperature readings more accurate.

"Emissivity" is the way that any object emits heat energy into the air. Emissivity is always rated by a numerical value. Different types of materials have different emissivity values. An object's emissivity is dependent on its surface condition, material type, temperature and wavelength of temperature measurement. Adjusting the infrared temperature gauge to compensate for the emissivity values of different objects is the key in getting the most accurate temperature readings.

In general, an object having perfect heat dissipation characteristics has an emissivity value of 1.00 (think of this like saying 100%) – this is the absolute maximum possible emissivity value. Thus, the higher an objects' emissivity rating the better FlashPoint will be able to make an accurate reading without any adjustments. The lower an objects' emissivity rating, the more inaccurate FlashPoint will be and adjustment of FlashPoint's emissivity setting might be needed. The absolute lowest possible emissivity rating is 0.01.

In general, it is best NOT to change FlashPoint's emissivity value if you are not comfortable in doing so. FlashPoint's factory default emissivity value is 0.95, displayed as "95E" which will provide accurate temperature measurements for most materials. Many metals, especially those having very shiny or clean surfaces have emissivity values that vary in value. For example, the emissivity rating of shiny metals such as copper can be extremely low. If you measured the temperature of copper using an infrared temperature gauge the reading could be MUCH lower than the temperature measured using a thermometer which makes physical contact with the copper. This is because the emissivity value of copper is extremely low at 0.05. Adjusting FlashPoint's emissivity value for materials having very low emissivity values might be desirable to get the most accurate temperature measurements. In addition, if the heated object is significantly hotter than the temperatures of the materials immediately surrounding the object, it may be desirable to change FlashPoint's emissivity value.

To change FlashPoint's emissivity setting, first turn the gauge on by pressing the "MEASURE" button, then press the "MODE" button five times for the emissivity function. Here, "95E" will show on-screen. Press the "MEASURE" button to increase the gauge's emissivity value. To select a lower emissivity value, keep pressing the "MEASURE" button and the reading will reset to "1E" and will continue to count upward to the desired level. Press the "MODE" button again to confirm the desired setting and exit the emissivity screen. For information relating to the emissivity of specific materials, please contact Hobby Services. **Note:** Non-contact infrared temperature gauges are not recommended for use in measuring the temperature of shiny or polished metals.

For R/C use, there are 3 commonly used emissivity settings:

1) Aluminum: Sandblasted (standard car and airplane engines, not anodized) set the emissivity at 21E.
2) Aluminum: Anodized (for colored car and airplane engines, may be powder coated) set the emissivity at 77E.
3) Batteries Packs (with or without covering) and Airplane Covering: Leave at default 95E.

LCD ERROR MESSAGES

FlashPoint incorporates visual diagnostic messages as follows:

"Hi" or "Lo" will be displayed when the measured temperature is outside of the -27 to +428°F range of the instrument. "Hi" will show when the measured temperature is higher than +427°F, and "Lo" will show when the temperature is lower than -27°F.

When FlashPoint is exposed to rapid changes in ambient or air temperature, "Er2" will show on-screen. "Er3" is shown when the ambient air temperature exceeds +14 to +122°F (-10 to +50°C). In either case, allow approximately 30 minutes for FlashPoint's electronic components to adjust and

stabilize themselves to the ambient temperature. For best results, use in ambient temperatures that range from +32 to 104°F (0 to +40°C).

For any other "Er" error messages it is necessary to reset FlashPoint's circuitry. To reset, turn the instrument off, remove the battery and wait for a minimum of one minute, then re-insert the battery and turn the unit on. If the error message remains please contact Hobby Services for further assistance. Dispose of used lithium batteries properly and keep away from children.

ON-SCREEN BATTERY INDICATOR

FlashPoint's custom LCD incorporates a built-in battery power indicator that indicates the condition of the on-board battery, which functions as follows:

"Full Battery:" Temperature measurement fully functional.

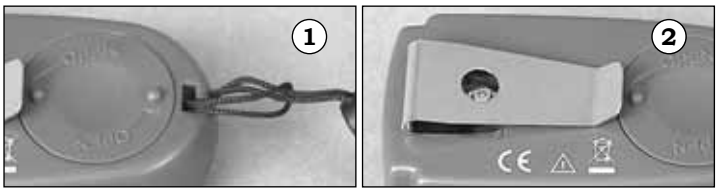
"Partially Full Battery:" Battery needs to be replaced, but temperature measurements are possible.

"Low Battery:" Temperature measurements are no longer accurate or possible.

BATTERY REPLACEMENT

When the battery power icon indicates the on-board battery is low, the battery should be replaced immediately ONLY with CR2032 lithium cell, which are commonly found at major retail stores. The battery is located under the twist cover on the rear of the case. **Please Note:** It is important to turn the instrument off before replacing the battery; otherwise it could cause the FlashPoint to malfunction. When replacing the battery, make sure the "+" symbol is facing outward!

WRIST STRAP & BELT CLIP



To attach the included wrist strap, insert the thin thread into the holes (located on the bottom, rear of the temperature gauge). Pass the thick part of the wrist strap through the middle of the thin thread (see picture for details).

A belt clip is also located on the back of the temperature gauge, for easy portability if you do not wish to use the wrist strap. Be sure not to bend the belt clip past reasonable limits, as it could wear and possibly break.

STORAGE & CLEANING

FlashPoint's sensor lens is the most delicate part of the gauge. The lens should be kept clean at all times. Care should be taken when cleaning the lens using only a soft cloth or cotton swab with water or rubbing alcohol, allowing the lens to fully dry before using FlashPoint. Do NOT submerge any part of FlashPoint in any liquid. FlashPoint should be stored at room temperature between +50 to 72°F (+10 to +40°C).

WARRANTY

DuraTrax warrants this product to be free from defects in materials and workmanship for a period of one (1) year from the date of purchase. During that period, we will repair or replace, at our option, any product that does not meet these standards. You will be required to provide proof of purchase date (invoice or receipt). If during the one year period, your DuraTrax product shows defects caused by abuse, misuse, alteration or accident, it will be repaired or replaced at our option, at a service charge not greater than 50% of the current retail price. Be sure to include your daytime telephone number in case we need to contact you about your repair. This warranty does not cover components worn by use, application of reverse voltage, cross connections, poor installation, subjection of components to foreign materials, any alterations to wires, or tampering. In no case shall our liability exceed the original cost of the product.

Your warranty is voided if...

A. You tamper with any of the electronic components.
B. You allow water, moisture, or any foreign material to enter the case.

Under no circumstances will the purchaser be entitled to consequential or incidental damages. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state. If you attempt to disassemble or repair this unit yourself it may void the warranty.

For service on your DuraTrax product, either in or out of warranty, send it post-paid and insured to:

HOBBY SERVICES
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Champaign, IL 61822
(217) 398-0007
E-mail: *hobbyservices@hobbico.com*
Internet address: *www.duratrax.com*