TGX1 Infrared Temperature Gauge with Stopwatch

Instruction Manual

The O'Donnell Racing TGX1 is a non-contact infrared temperature gauge with a built-in stopwatch specifically designed for use with R/C engines, batteries, and motors. Simply aim the TGX1 at the target and press the MEASURE button to quickly and easily display the surface temperature. The distance to target ratio is 1:1, therefore the temperature gauge should be positioned as close to the target as possible.

Special Features

- **Large easy to read backlit LCD screen**
- **Built-in stopwatch feature to check lap times**
- **O' Cone for more accurate temperature readings of the target area**
- **Soft rubber grips**
- **Battery level indicator**
- **Reads temperatures in Fahrenheit (F) or Celsius (C)**
- **Adjustable Emissivity**
- **Easy push-button control for setup and measurement**
- **Auto power-off feature to extend battery life**
- **Protective belt pouch for easy access and portability**
- **Compact and lightweight**

Specifications

- **Temperature Reading Range: -27° to +428°F (-33° to +220°C)**
- **Infrared Accuracy: 4°F (2°C) or +/- 2% of reading whichever is greater**
- **Ambient Temperature Operating Range: +14° to +122°F (-10° to +50°C)**
- **Adjustable Emissivity: 0.05 to 1.00 (1.00 default)**
- **Display Resolution: 0.1° F or C**
- **Response Time: 1 Second**
- **Field of View: 1:1 optics ratio**
- **Battery Life: 960 (15 sec) readings or 1 hour continuous**
- **Battery Type: CR2032 Lithium (3V)**
- **Dimensions: 3.4x1.9x0.9 inches (85x48x23 mm)**
- **Weight: 1.53 oz (43.6 g)**

Important Precautions

- Electromagnetic/Radio Frequency Interference (EMC/RFI): 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. Care should be taken to keep the TGX1 at least 6 inches away from R/C transmitters to avoid radio frequency interference.
- Avoid setting the TGX1 in direct sunlight which can cause overheating and erratic temperature readings. Keeping your TGX1 in its protective pouch or a pocket will help protect it from overheating.
- Avoid keeping the TGX1 too close to objects that continuously generated high heat (like a hot plate) for long periods of time, which can cause overheating of the TGX1.
- Do not allow water or moisture to come in contact with the TGX1.
- Replace battery ONLY with a CR2032 lithium non-rechargeable battery.

The TGX1 Advantage

Nitro engines should last a long time if they are well maintained. To assist with extending the life of your engine as well as getting it to perform its best, O'Donnell suggests using the TGX1 Temperature Gauge to monitor engine temperatures. With the TGX1, you can measure engine temperatures quickly and easily to ensure you don't cause permanent damage to your engine by allowing it to overheat. In addition, the TGX1 can assist with the fine tuning of your engine by helping to find the proper temperature before you start any needle adjustments. Adjusting the needle settings properly can only be done on an engine that is running at normal operating temperature. The TGX1 is also great for checking lap times with the built-in stopwatch to see if the adjustments you have made on your engine are paying off with faster lap times.

Note: Most two-stroke engines run properly between 200ºF and 270ºF however, you should consult your engine manufacturer for the appropriate temperature range for your specific engine.

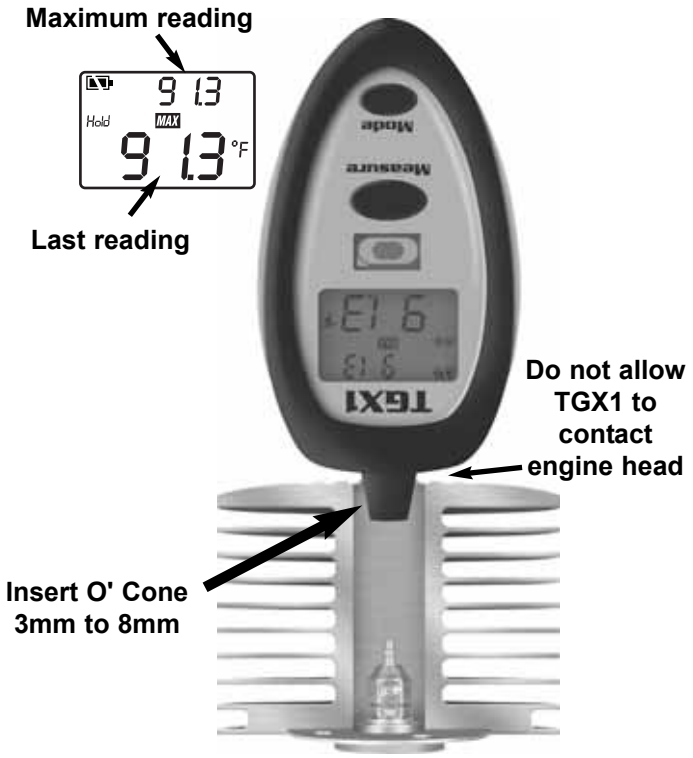
Warning: Avoid setting the TGX1 in direct sunlight which can cause the TGX1 to overheat causing it to give erratic temperature readings. Your TGX1 should always be stored in its protective pouch. After the unit has been removed from direct sunlight and allowed to cool, all functions will return to normal.

Taking Temperature Measurements

Point the TGX1 at the glow plug by inserting the O'Cone™ into the engine head cavity as far as possible as shown below. It is best NOT to allow the TGX1 case to actually touch the engine head, as this could adversely affect the accuracy of the temperature readings.

Press and release the MEASURE button to turn on the TGX1 and immediately begin measuring temperatures. If you press and hold down the MEASURE button, the temperature reading will continuously update until the button is released. **Note**: As shown in the diagram below, the small digits at the top of the screen update the MAXIMUM temperature the TGX1 reads while the MEASURE button is being pressed. The big digits at the bottom of the screen show the current temperature reading.

Helpful Hint: As shown in the diagram, for the most accurate temperature readings, always insert the O' Cone into the engine head cavity 3mm to 8mm, making sure **not** to allow the TGX1 case to come into contact with the head. Aim the TGX1 directly at the tip of the glow plug, because this is the hottest area of the engine, and then press and hold the MEASURE button for three to five seconds.

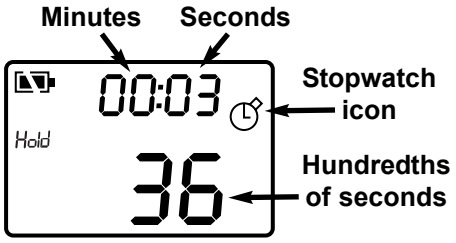


Stopwatch

1. Press the MEASURE button to turn on the TGX1.
2. Press the MODE button once and the stopwatch icon will start to flash.
3. Press the MEASURE button to start the stopwatch counting up from 0:00:00.
4. Press the MEASURE button to pause the stopwatch.
5. Press the MEASURE button to re-start the stopwatch from where it was paused.
6. Pressing the MODE button will reset the timer to 00:00 whether the stopwatch is running or paused.
7. Pressing the MODE button while the stopwatch is paused will return you to the main (thermometer) screen.

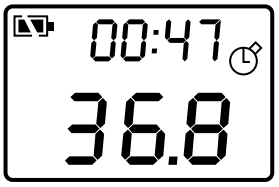
Notes:

- Backlight does not illuminate while in stopwatch mode, to extend battery life.
- Stopwatch will run continuously if it is not stopped manually.
- Minutes and whole seconds are displayed in small digits at the top of the screen. Fractions (1/100) of a second are displayed in large digits at the bottom of the screen.



This screen shows 3 and 36 one-hundredth seconds.

This changes when the stopwatch reaches 30 minutes at which time the small digits at the top show hours and minutes, and the large digits at the bottom of the screen show seconds and 1/10 of a second.



This screen shows 47 minutes, 36 and 8 tenths seconds.

Temperature Scale & Emissivity

Press MEASURE button to turn on unit.

Temperature Scale - °F or °C
Press the MODE button twice. The °F icon will flash. Press the MEASURE button once to change the setting. The setting will change from °F to °C or °C to °F and immediately return to the main screen. This setting will be retained for future use until changed manually.

Emissivity
The emissivity can be adjusted to allow the TGX1 to be used for a variety of other uses other than taking temperature readings of nitro engines. **The emissivity must be set correctly for the material being measured or the temperature reading may not be accurate**.

A search of the internet will show many links for 'emissivity tables'. Keep in mind these tables are for different types of materials in general, and are not geared directly for R/C products. In most cases, only minor adjustments to the emissivity setting might be needed for different types of engine heads. If unsure what emissivity setting to use, the default setting of 1.00 (100E) typically provides the most accurate temperature reading for nitro engines when used as shown in the illustration at left. The emissivity of the temperature gauge can be changed from 0.05 (5E) to 1.00 (100E). To change the emissivity setting, press the MODE button 3 times then press MEASURE button once to

advance the setting one at a time. Holding down the MEASURE button will scroll through the entire range of settings. Once the unit reaches 100E, it will start over at 5E and go through the entire range again. Once the desired emissivity setting is reached, press the MODE button once to lock in the setting and immediately return you to the main screen. This setting will be retained for future use or until it is changed manually.

Auto - Off Feature

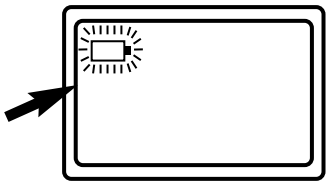
1. The temperature gauge will shut off automatically after approximately 15 seconds of inactivity.

2. In stopwatch mode, the unit will shut off after approximately 15 seconds of inactivity if the stopwatch has not started timing. It will shut off after approximately 45 seconds of inactivity IF the stopwatch has been started AND then is paused –OR- if the stopwatch has been running and was reset to 00:00.

Battery Level Indicator

Indicates full battery level.

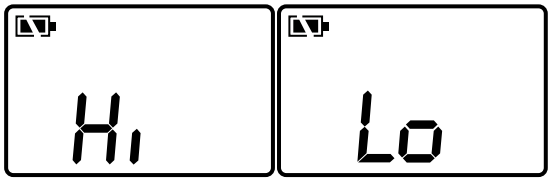
Indicates partial battery level.



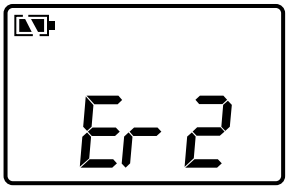
Indicates low battery level and battery will need to be replaced.

Error Messages

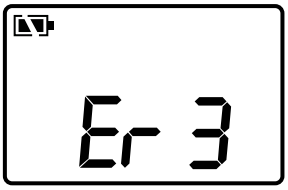
The TGX1 incorporates the following visual diagnostic error messages:



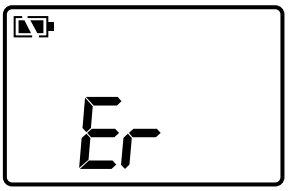
“Hi” or “Lo” is displayed when the temperature being measured is outside of the range of the instrument, “Hi” when higher than +428ºF (+220ºC) and “Lo” when lower than -27ºF (–33ºC).



“Er2” is displayed when the temperature gauge is exposed to rapid changes in the ambient temperature.



“Er3” is displayed when the ambient temperature of the temperature gauge EXCEEDS +14ºF (-10ºC) OR +122ºF (+50ºC). In both cases you should allow plenty of time (minimum 30 minutes) for the thermometer to stabilize to the working/room temperature.



For all other error messages it is necessary to reset the temperature gauge. To reset, wait for the instrument to power off, remove the battery and wait for a minimum of one minute, then reinsert the battery and turn on. If the error message remains, please contact Hobby Services for further assistance.

Replacing the Battery

1. The unit must be turned off before replacing battery or a malfunction could occur.

2. Remove the belt clip on the rear of the gauge by removing the screw and pulling the clip straight off.

3. Twist the battery door clockwise approximately 1/8th turn and remove door.

4. Carefully remove battery.

5. Replace battery only with a 3 volt CR2032 lithium cell, which are readily available at many local retailers.

Storage & Cleaning

The thermometer should be stored at -4º to 149ºF (–20º to +65ºC). The sensor is the most delicate part of the thermometer and should be kept clean at all times. Care should be taken when cleaning the lens using only a soft cotton swab with water or medical alcohol, allowing the lens to fully dry before using the thermometer, do not submerge any part of the unit in water or other liquid.

1-Year Limited Warranty

O'Donnell 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 O'Donnell 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 and email address 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 O'Donnell product, either in or out of warranty, send it post-paid and insured to:

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