

EGT-1

EGT (Exhaust Gas Temperature) Gauge

Operating Manual – English 1.00



Introduction

The EGT-1 is a single channel fully programmable digital EGT (Exhaust Gas Temperature) gauge.

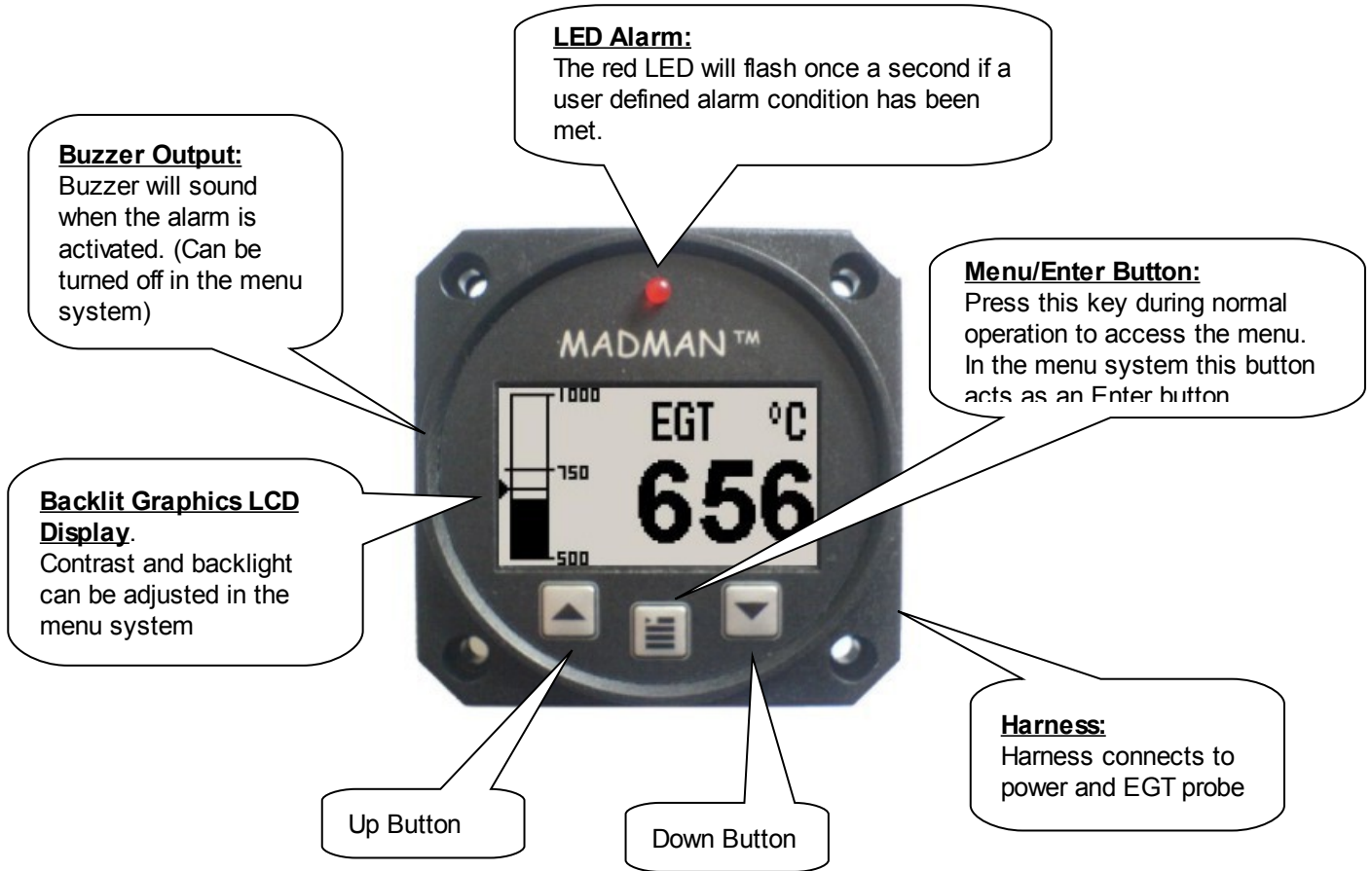
The EGT-1's high accuracy is due to its built in thermocouple linearization curves and cold junction compensation techniques. Temperature probes can be common J or K type thermocouple probes as used in EGT sensors. Temperatures can be displayed in degrees Celsius or degrees Fahrenheit from -270°C to 1200°C (-454°F to 2192°F).

The EGT-1 also offers a programmable EGT high alarm as well as the maximum temperature reached is captured into permanent memory. The EGT-1 also boasts a battery voltage display with programmable low/high alarm, a built in hour meter and service interval timer.

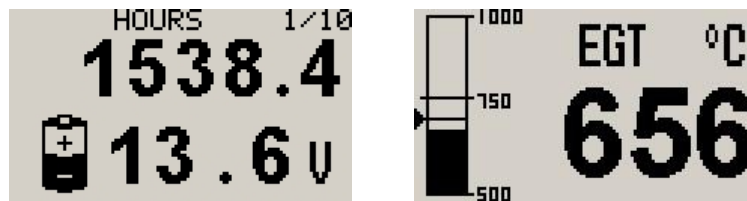
1 Features

- EGT (Exhaust gas temperature) monitoring with user settable high alarm
- Includes linearization of EGT K or J Type probes and is cold junction compensated for greater accuracy
- Battery voltage display, the EGT-1 can measure voltages up to 30V (Can be used in 12V and 24V vehicles) and contains a programmable low/high voltage alarm to automatically catch alternator failures, drive belt failures and bad batteries
- Hour meter display to determine actual vehicle ignition on time with 1/10 hour resolution
- Built in service interval reminder based on vehicle ignition on time
- Includes an audible alarm (The sound can be turned on/off e.g. for game viewing)
- Includes a visual alarm (Built in red LED turns on when an alarm condition occurs)
- External alarm output for remote indicators etc.
- Backlit graphics LCD with adjustable contrast
- On board voltage reversal and over voltage protection for harsh vehicle environments
- SMPS (Switch mode power supply) for use in both 12V and 24V vehicles
- Maximum values of all readings are recorded
- Easy to use menu system for user parameter setup
- 1 year limited warranty

2 EGT-1 Layout



3 Information Screens



The information display screens can be viewed by pressing the up key in the normal run mode. The Unit can also be set up to toggle between the screens automatically. The EGT-1 will automatically jump to the information display screen that causes an alarm condition.

3.1 Battery Volts / Hour Meter Display



The EGT-1 can measure the vehicles battery voltage in the range of 8V to 30Vdc. The EGT-1 has built in over-voltage and reverse voltage protection and contains a programmable low/high voltage alarm to automatically catch alternator failures, drive belt failures and bad batteries.

The hour meter is a useful instrument to display actual ignition on time for routine maintenance. The Hour meter is displayed as hours and fractional minutes in 1/10 of an hour resolution (increments every 6 minutes). The hour meter can be reset to zero in the calibration menu.

Note:

If the supply voltage exceeds 30Vdc then a voltage over-range warning message is displayed.

The hour meter updates its internal minute counter every minute. If the unit is turned on and off for a period of less than a minute, then the hour meter will not increment its internal registers.

3.2 EGT (Exhaust Gas Temperature) / Pyrometer

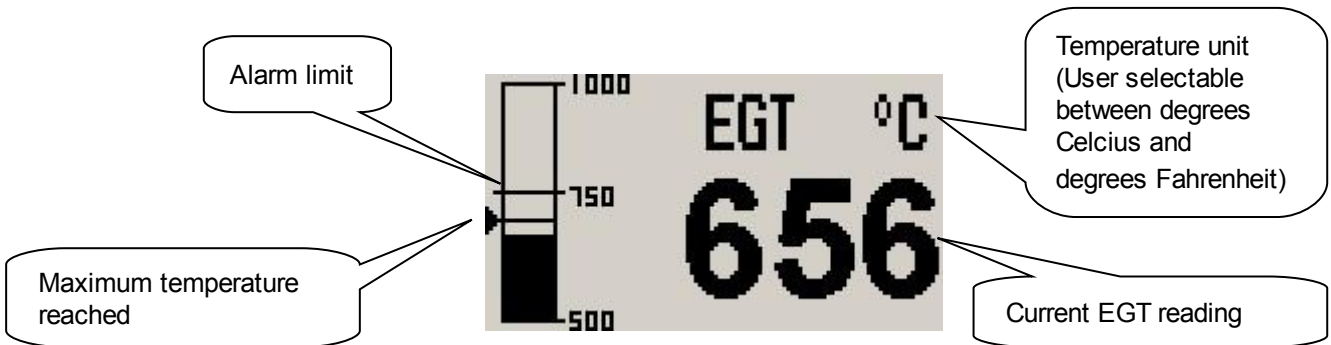
Few things will damage or kill a diesel engine like excessive exhaust gas temperatures, yet the EGT gauges are not standard equipment fitted by the diesel engine manufacturers and are only available as an after market add on unit.

The EGT-1 can alert the driver of any situations where the EGT gets to high which could cause irreparable engine and or turbo charger damage. The EGT can be affected by a too rich air/fuel mixture or an air intake problem. Air intake problems could include a blocked/partially blocked air intake, a dirty air cleaner, high water temperatures etc. The EGT-1 EGT gauge could also save on fuel costs as the EGT is directly related to the air/fuel mixture.

The EGT probe can be installed on the exhaust manifold or immediately after the turbo. It is recommended to install the EGT probe before the turbo as temperature differences of up to 200 °C between the inlet and outlet of the turbo has been measured under heavy loads.

Under normal driving conditions the EGT may vary between 250 °C and 650 °C. For most vehicles the Alarm limit should be set to 720 °C. Please be aware that if pushing the engine hard or driving up a steep hill, could cause your EGT to exceed this temperature. If you have prolonged high EGT then it is recommended to immediately have it check out by a qualified mechanic.

Madmans custom built thermocouple EGT probes are specifically designed for automotive use. The Madmans EGT probes can handle temperatures up to 1300 °C



The EGT-1 can use K-Type or J-Type thermocouples to display the EGT temperature. The EGT-1 contains precision instrumentation electronic circuitry to amplify and lineariser the thermocouple sensor. The EGT-1 also has built in cold junction compensation, to make the EGT reading as accurate as possible. The EGT parameters can be changed in the menu system.

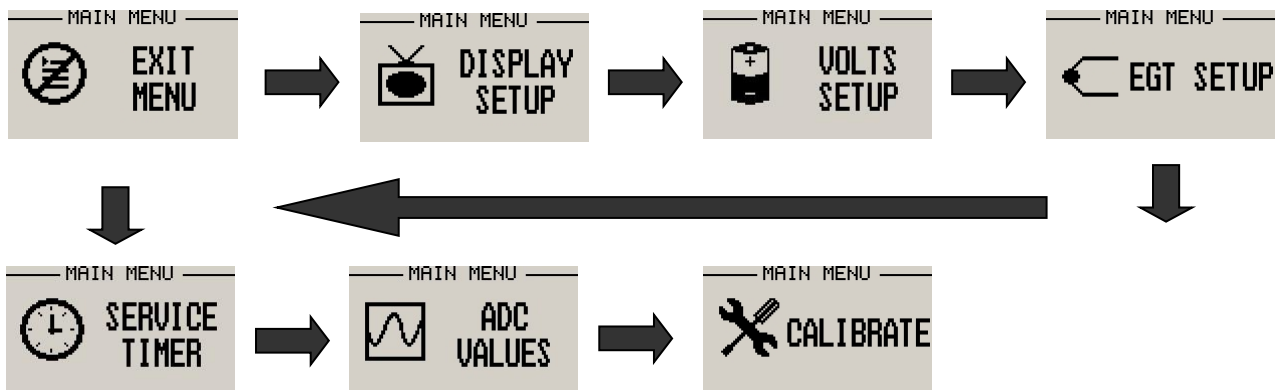
3.3 Maximum Values



Press the down key to display the maximum values recorded screen. Press the up button once the maximum values recorded screen is displayed to reset the maximum values.

Note: The maximum values are stored in non-volatile memory and are recalled on power-up.

4 Menu System



Use the up, down or menu keys to navigate through the menu system. The ADC values and calibrate menus are only available when powering up the unit with the menu key pressed.

WARNING: The EGT-1 must not be operated by the driver when the vehicle is moving. All setups must be done prior to driving the vehicle.

4.1 Exiting the menu system

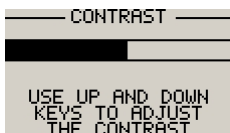


Press the menu button when you see the exit menu screen to exit the menu. The EGT-1 will also exit the menu if no key is pressed within 30 seconds.

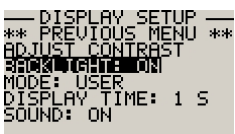
4.2 Display Setup



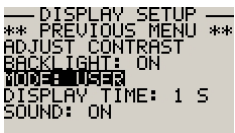
Display parameters can be setup here



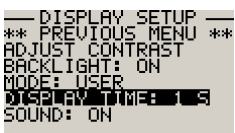
Select this menu option to adjust the display contrast.



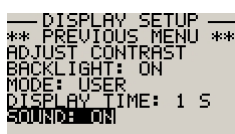
Select this menu option to turn the backlight on or off



This menu option allows the user to either toggle the information screens manually using the up or down keys or automatically (set by the display time).

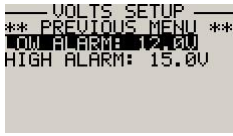


The user can change the time in auto mode that the information screens are displayed. A time of 1, 3, 5, 10, 15, 30, 60 seconds can be selected



The sound of the audible alarm can be turned on of off.

4.3 Volts Setup

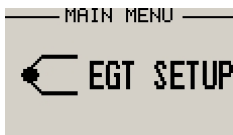


Enter the low voltage set-point for when the alarm must be activated. Any voltage below this value will activate the alarm.

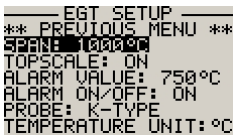


Enter the high voltage set-point for when the alarm must be activated. Any voltage above this value will activate the alarm.

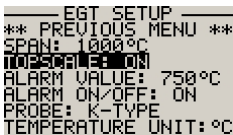
4.4 EGT (Exhaust Gas Temperature) Setup



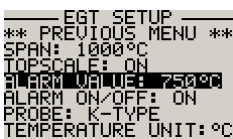
The EGT Setup menu item allows the user to adjust the EGT properties.



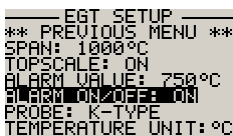
Set the range of the EGT sender. The range can be set from 400°C (752°F) to 1200°C (2192°F)



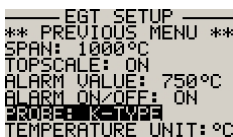
This allows the user to zoom into the top half of the bargraph resulting in a higher display resolution. This option set to "ON" is recommended.



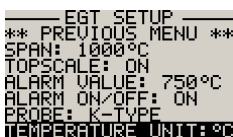
Adjust the setpoint when the alarm must be activated.



This allows the user to turn the alarm on or off.

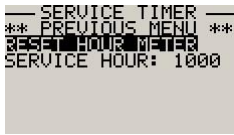


Select whether the EGT sender connected to the EGT-1 is a K-Type or a J-Type probe.

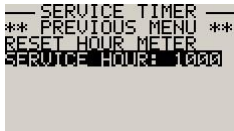


Select whether all the temperature readings are displayed in degrees Celcius or degrees Fahrenheit.

4.5 Service Timer



This will reset the hour meter to zero



Enter the next time in hours that the EGT-1 must remind you that a service is due. The service reminder message will appear for 5 seconds after the unit has switch on if the hour meter hours are greater/equal then the service hour setting.

5 Alarms

The alarm sound can be turned on or off in the display setup menu. This might be favorable for example during game viewing. Please note that the alarm sound only becomes active 30 seconds after power is applied to the EGT-1. The alarm output on the power connector is of a transistor open collector type. When it is turned on it will connect the alarm output to ground. Maximum current through alarm output should not exceed 250mA. The EGT-1 will automatically jump to the information display screen that is causing the alarm.

6 Cleaning

The unit should not be cleaned with any abrasive substances. The screen is very sensitive to certain cleaning materials and should only be cleaned using a clean damp cloth.

Warning: The EGT-1 is not waterproof, serious damage could occur if the unit is exposed to water and or spray jets.

7 Specifications

Operating Temperature Range	-10°C to 50°C (14°F to 122°F)
Storage Temperature Range	-20°C to 80°C (-4°F to 176°F)
Humidity	<85% non-condensing
Power Supply	8 to 30Vdc SMPS (Switch mode power supply) with built in 33V over voltage and reverse voltage protection
Current Consumption	approx. 40mA @ 13.8V (backlight on/off)
Display	114x65 graphics LCD display. Contrast and backlight is user configurable
ADC	12bit over sampled successive approximation
Alarm	Red LED as well as audible and an open collector transistor output.
EGT probe	The EGT-1 supports both K-Type or J-Type thermocouple probes
EGT compensation	K-Type and J-Type probe linearization with build in precision internal temperature reference
Alarm Contact	Transistor open collector, Max current = 250mA
Dimensions	60mmx60mmx61mm (2.36"x2.36"x2.40") (See attached dimensional drawing)
Enclosure	2.25" ABS, black in color, front or rear mounting
Non-volatile memory storage	100000 write cycles

8 Installation

DIY installation can be done but it is recommended that a professional automotive installer installs the EGT-1.

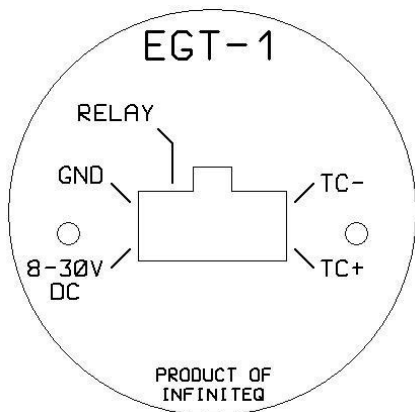
The use of an external 1A fuse is recommended. Please ensure that the supply voltage will not drop below 8V during operation as this may result in incorrect readings. Be sure to install a reference connection between the ground terminal of the instrument and the engine block. If the engine block is not connected to a good reference, readings may show large errors. This reference connection must not be used as a ground line for other current users. A straight, good quality connection is required that is not shared with anything else.

Warning: Do not install the unit in direct sunlight as this could cause the unit to exceed the operating temperature and can cause damage to the unit.

8.1 Extending leads of probes and senders

Thermocouple leads as used with the EGT probes can be extended either with ordinary copper cable or with special thermocouple extension cable. The choice of either depends on your desired accuracy. If it is possible in your installation to ensure that both ends of a copper extension cable will be at the same temperature (or very close), then it is quite possible to use the copper cable. In most open-air installations this will be the case. Should this not be possible or you require best possible accuracy at all times, you can obtain a special thermocouple extension cable. This cable is made from the same metals as your probes cable but uses ordinary plastic sleeving to save costs. In either case, ensure that the cable is not routed close to sources of electromagnetic interference of any kind. The voltages present in this cable are very small and are subject to changes applied by external fields. This can lead to false temperature indications.

8.2 EGT-1 Rear panel and connector layout



Connector Colour Codes	
Red	8 – 30 VDC
Black	Ground
Purple	Relay Contact
White	- EGT probe (Red probe lead)
Orange	+ EGT probe (Yellow probe lead)

9 Warranty

This product carries a warranty for a period of one year from date of purchase against faulty workmanship or defective materials, provided there is no evidence of misuse or evidence that the unit has been mishandled. Warranty is limited to the replacement of faulty components and includes the cost of labor. Shipping costs are for the account of the purchaser.

Note: Product warranty excludes damages caused by unprotected, unsuitable or incorrectly wired electrical supplies and or sensors, and damage caused by inductive loads.

10 Disclaimer

Operation of this instrument is the sole responsibility of the purchaser of the unit. The user must make themselves familiar with the operation of this instrument and the effect of any possible failure or malfunction.

The manufacturer reserves the right to alter any specification without notice

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