

# Stratmaster Maxi Single

## TC-3

### Twelve channel thermocouple temperature display unit



The TC-3 thermocouple display unit is a 12 channel 3.5" instrument that contains all the features necessary to monitor EGTs and CHTs.

The unit can be configured to display up to 12 thermocouples in an easy to understand bar graph format.

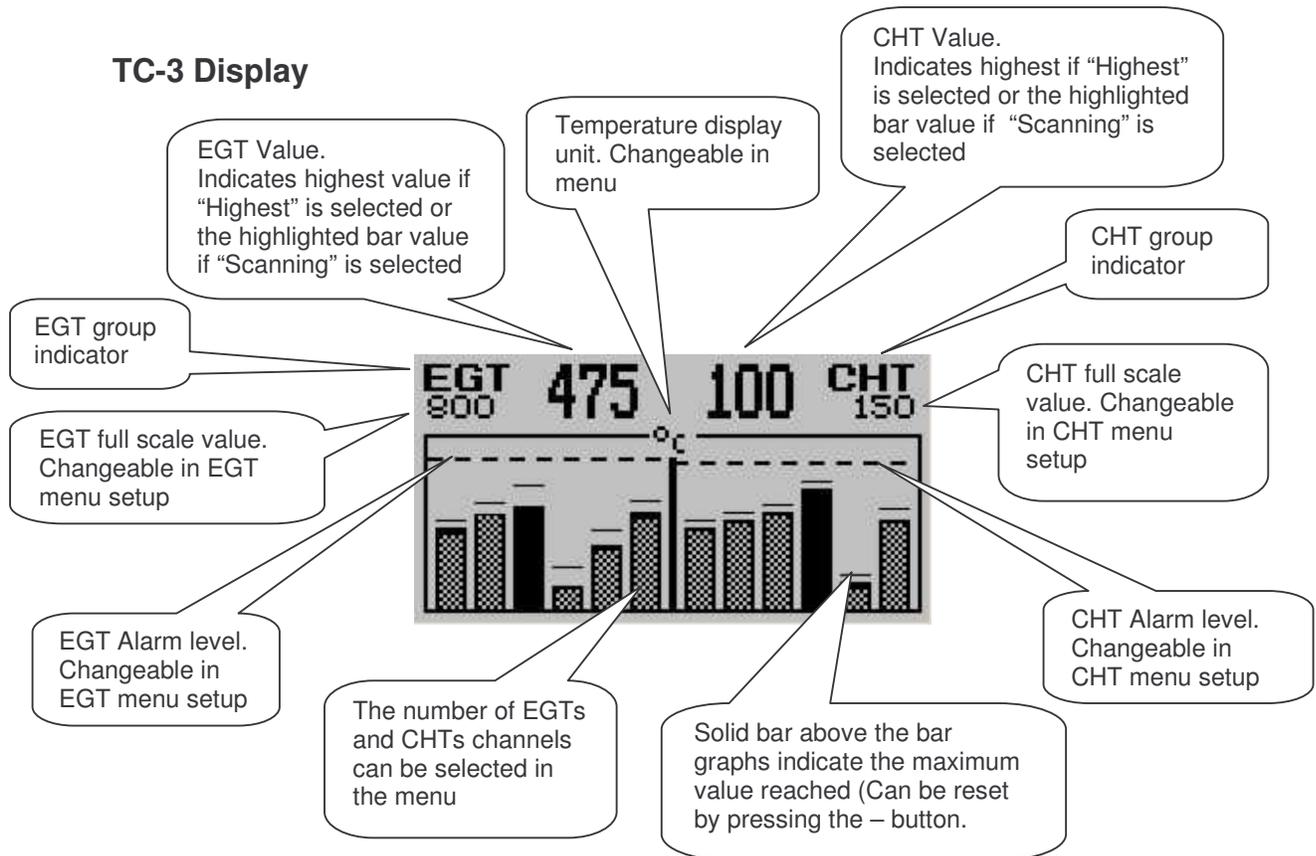
The unit can also indicate the current highest thermocouple reading for each group (EGT/CHT) by highlighting the individual bar graph and displaying its temperature, or it can be configured to "scanning" where the unit will cycle through each thermocouple, highlighting it as well as displaying its temperature. Maximum temperature for each thermocouple is indicated by a solid line above the thermocouples bar graph.

Each group of EGT or CHT thermocouples can also have an alarm output activated when a group alarm setpoint has been exceeded. This can be used to switch a visual alarm indicator such as a lamp.

The instrument is fully programmable by the user resulting in the most flexible solution available.

Temperature probes can be common K or J type thermocouple probes as used in CHT or EGT sensors. Temperatures can be displayed in degrees C or degrees F. Each channel has a range of 0 degrees C to 1200 degrees C (32 to 2000 degrees F).

## TC-3 Display



## Setting up the TC-3

Press the Menu key to enter the menu (Shown below). You can move forward and backwards in the menu by using the + and - keys. To change or select a menu item, move the highlight to the desired item and then press the Select (Enter) key. To end an edit or function, press the Menu key again.

To exit the menu and continue normal operation, press the Menu key again.

Note: all changes done will only be stored if you exit the Menu and return to the main display. The menu will automatically exit after no keys have been pressed for approximately 30 seconds.

## TC-3 Menu Layout

```

Temp in Deg C
EGT setup
CHT setup
Contrast: 35
Backlight: On
High Temps
ADC
    
```

## Description of menu items ...

### Temp in Deg ...

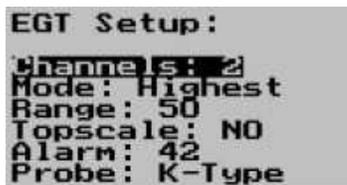


Choose your temperature unit. You can select Degrees Celsius *C* or Degrees Fahrenheit *F*.

### EGT Setup (& CHT Setup)



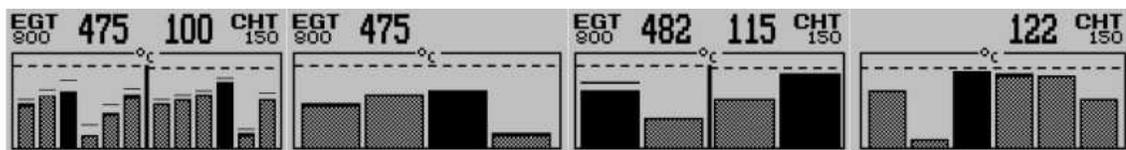
### Channels ...



Select the number of EGT or (CHT) channels you want to use. Choices are from 0 to 12. The temperature display will configure itself to make best possible use of the available display size. Please note that the minimum number of channels that can be displayed is 4 ie: if you have selected 2 CHT channels then the EGT channels can only be selected between 2 and 10. If 0 channels is selected then

that group will not be displayed.

### Display examples



6 EGT, 6 CHT

4 EGT only

2 EGT, 2 CHT

6 CHT only

## Mode ...

```
EGT Setup:
Channels: 2
Mode: Highest
Range: 50
Topscale: NO
Alarm: 42
Probe: K-Type
```

A selection between *HIGHEST* or *SCANNING* can be selected. If *HIGHEST* is selected then the current highest thermocouple temperature is displayed. If *SCANNING* is selected then the unit will cycle through each thermocouple (+/- 1 second), highlighting it as well as showing its temperature.

## Range ...

```
EGT Setup:
Channels: 2
Mode: Highest
Range: 50
Topscale: NO
Alarm: 42
Probe: K-Type
```

This function sets the top end of your temperature bar graph. It has no effect on the actual temperature range that can be displayed in the digital temperature readout. Select the range to be just higher than the highest temperature you expect to measure using this channel. Selecting Range will automatically suggest a suitable alarm level, change the alarm level to your desired setting

after you select the range.

## Topscale ...

```
EGT Setup:
Channels: 2
Mode: Highest
Range: 50
Topscale: NO
Alarm: 42
Probe: K-Type
```

Select this function to *YES* if you want the bar graph display to show the upper half of the temperature range only. This results in a higher resolution of the temperature range you may be interested in. We recommend that you set this to *YES*.

## Alarm ...

```
EGT Setup:
Channels: 2
Mode: Highest
Range: 50
Topscale: NO
Alarm: 42
Probe: K-Type
```

Select the temperature that you would like to use as an alarm limit. Any temperature above this limit will activate the alarm. Active alarms will flash the affected channel and also activate the alarm contact that you can use to switch a lamp. If you do not want to use the alarm, either select a very high alarm limit or select the function to "off". The alarm limit is also indicated on the display by a

dashed line.

## Probe ...

```
EGT Setup:
Channels: 2
Mode: Highest
Range: 50
Topscale: NO
Alarm: 42
Probe: K-Type
```

Select if you are using a *K-Type* or *J-Type* thermocouple probe for this group. All probes supplied by MGL Avionics are **K-Type**. J-types are sometimes used with American made CHT probes. All EGT probes are K-type.

### Contrast ...



Temp in Deg C  
EGT setup  
CHT setup  
Contrast: 35

This function allows you to change the display contrast to your liking. You can select values from 20 to 45.

### Backlight ...



EGT setup  
CHT setup  
Contrast: 35  
Backlight: On

This function allows you to switch the display backlight on or off.

### High Temps



CHT setup  
Contrast: 35  
Backlight: On  
High Temps

This function displays the peak temperature that was reached for each individual thermocouple. These values can be reset during the main display by pressing the – key.

### ADC



Contrast: 35  
Backlight: On  
High Temps  
ADC

This function is for technical personal. It is not used for ordinary operation of the unit.

## Technical specifications:

**Display temperature range (operational):** -20 to +80 degrees C

**Backlight:** on or off (Green LED)

**Supply voltage:** +8 to +18V. +24/28V with optional pre regulator.

**Supply current:** 25mA/50mA (backlight off/on)

**Thermocouples:** K-type or J-type

**Measurement range:** 0 to 1200 degrees C

**Technology:** Fully cold junction compensated using precision internal temperature reference.

**Measurement accuracy:** +/- 5 degrees typical over full temperature range, subject to quality of probe used. We recommend Stratomaster EGT and CHT probes.

**Measurement interval:** 0.5 seconds (all channels). 1000 samples/second, DSP noise filter.

**Inputs:** Differential, can use grounded and isolated probes.

**Common mode voltage range:** -2V to +3V

**Alarm contact:**

Maximum permissible current through alarm contacts: 500mA.

Maximum permissible voltage over alarm contacts: 50V.

**Typical load for alarm contacts:** 12V/1W lamp.

**Weight:** 190 grams

## Warranty:

MGL avionics warrants their products for a period of one year from date of purchase against faulty workmanship. 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 for operation on supplies with inductive loads:

Any operation of electronic instrumentation on power supplies that are subject to high voltages caused by operation of inductive loads (starter motors, solenoids, relays) are required to be fitted with suitable protection.

All Maxi Singles are guaranteed to withstand temporary over voltage up to 40V without additional protection. We recommend that measures are taken to prevent voltage transients in excess of this limit.

MGL Avionics recommends the fitment of a fuse in line with a 33V transorb (available from MGL Avionics) to protect electronic instruments, radios and intercom systems. Only one such arrangement is required for a cluster of instruments.

Please note that product warranty excludes damages caused by unprotected, unsuitable or incorrectly wired electrical supplies.

## Installation of the TC-3

The drawing on the following page shows the connections required to operate the TC-3.

Use the instruments menu system to setup the number of EGT & CHT channels you want to use. Select an alarm level for the EGT and CHT group if you want it to have an alarm.

Connect probes according to the colors of the wires. MGL probes. Supplied probes are marked with a yellow and a red lead.

If you use other probes and are not certain of their polarity, simply connect one up as TC1 and switch on the instrument. Warm the probe using your hand. If the indicated temperature decreases you need to change the polarity around.

Shown is typical wiring used to connect a 12V lamp as external alarm indicator. If you have more than one instrument you can wire all contacts in parallel so you can use a single lamp if so desired.

Power supply here assumes a 12V DC source. It is recommended to install suitable protection against over voltage such as can be generated by solenoids and starter motors

Be sure to install a reference connection between the minus 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 ground line for other current users. A straight, good quality connection is required that is not shared with anything else.

## Extending leads of probes and senders

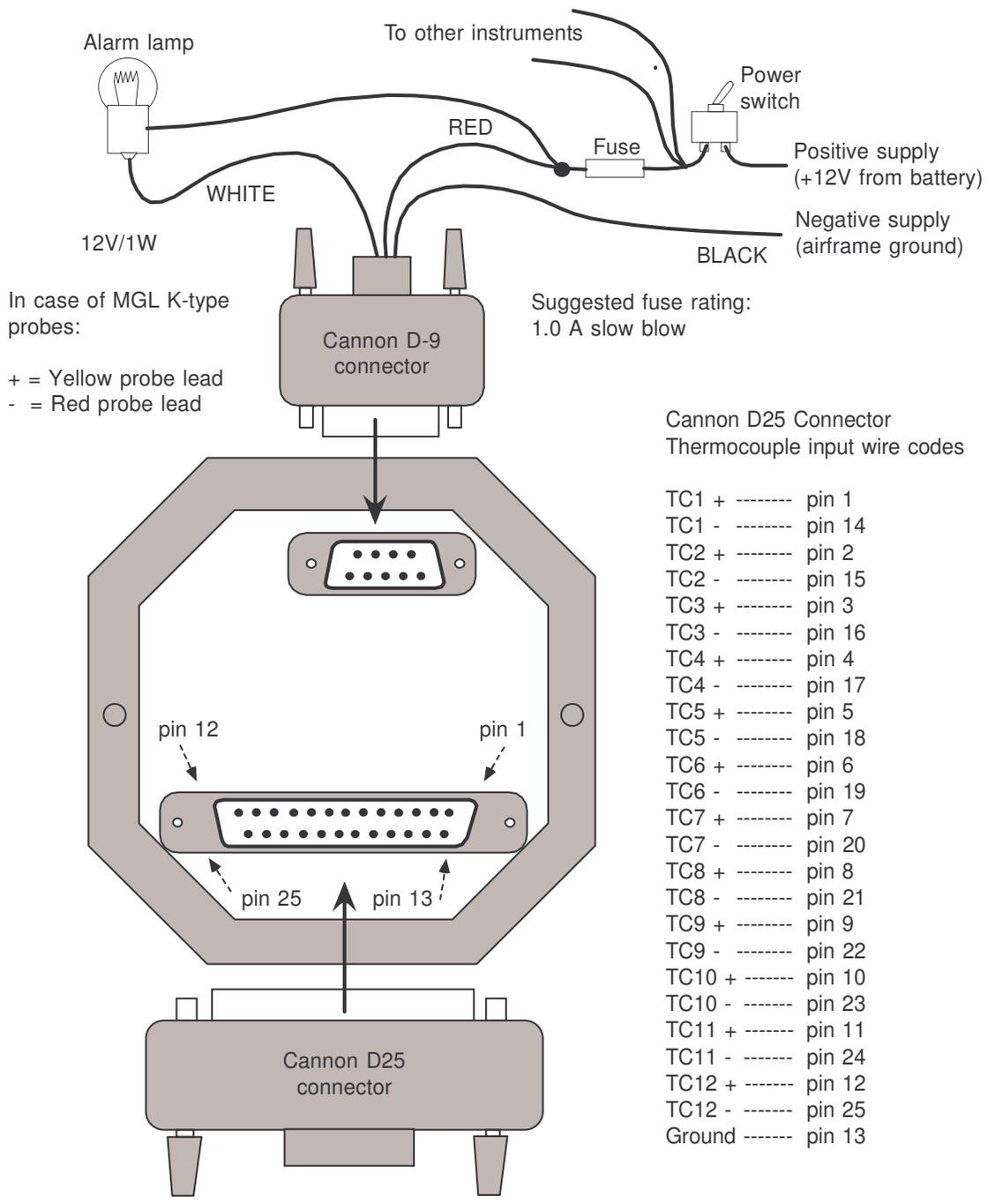
Thermocouple leads as used with the EGT and CHT probes can be extended either with ordinary copper cable or with special K-Type extension cable. The choice of either depends on your desired accuracy.

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 K-type 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.

You can check your installation by using a hand-held transmitter, such as an airband radio. If you transmit a signal, no change in temperature reading should occur.



In case of MGL K-type probes:  
 + = Yellow probe lead  
 - = Red probe lead

Suggested fuse rating:  
 1.0 A slow blow

Cannon D25 Connector  
 Thermocouple input wire codes

- TC1 + ----- pin 1
- TC1 - ----- pin 14
- TC2 + ----- pin 2
- TC2 - ----- pin 15
- TC3 + ----- pin 3
- TC3 - ----- pin 16
- TC4 + ----- pin 4
- TC4 - ----- pin 17
- TC5 + ----- pin 5
- TC5 - ----- pin 18
- TC6 + ----- pin 6
- TC6 - ----- pin 19
- TC7 + ----- pin 7
- TC7 - ----- pin 20
- TC8 + ----- pin 8
- TC8 - ----- pin 21
- TC9 + ----- pin 9
- TC9 - ----- pin 22
- TC10 + ----- pin 10
- TC10 - ----- pin 23
- TC11 + ----- pin 11
- TC11 - ----- pin 24
- TC12 + ----- pin 12
- TC12 - ----- pin 25
- Ground ----- pin 13

Reference ground  
 (connect to engine block)  
 D25 pin 23

Join instrument wires to probe wires  
 close to instrument so the junctions are  
 at a very similar temperature compared to  
 the D-25 connector. This will ensure  
 maximum possible accuracy.