Stratomaster Maxi Single

TC-2

One to Four channel thermocouple temperature display unit

The TC-2 thermocouple temperature display unit is a 3.5” instrument that can be configured to perform the functions of a single, dual, triple or quad channel temperature indicator.
Typical uses include EGT or CHT gauges. Each channel displayed can be setup independently for temperature ranges as well as alarms.
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).

Each channel can be programmed to activate an alarm contact on exceedance of a programmable temperature. This can be used to switch a visual alarm indicator such as a lamp.

Setting up the TC-2

Press the Menu key to enter the menu. 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.

Temp in …

Choose your temperature units. You can select Degrees Celsius or Degrees Fahrenheit.

Channels …

Select the number of channels you want to use. Choices are from 1 to 4. The temperature display will configure itself to make best possible use of the available display size. Temperature bargraphs are available for all selections.

Single channel Two channels Three channels Four channels

Channel (1-4) set

Selection of these menu functions will result in a screen giving you options to choose various settings for the relevant channel.

Contrast …

This function allows you to change the display contrast to your liking. You can select values from about 6 to 25.

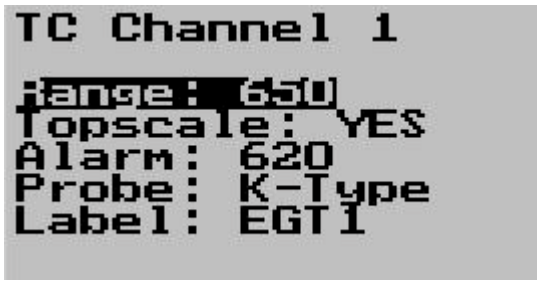
Backlight …

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

ADC

This function is for technical personal. It is not used for ordinary operation of the unit. This function can be accessed if both “+” and “-“ are pressed at the same time as the instrument is switched on.

Setting up a channel



Selecting to setup any of the four channels results in a display similar to the above.
When you have finished with your setup, press the Menu key to exit.

Range …

This function sets the top end of your temperature bargraph. 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 …

Select this function to “yes” if you want the bargraph 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. For engine temperature measurements we recommend that you set this to “yes”.

Alarm …

Select the temperature that you would like to use as 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”.

Probe …

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

Label …

Choose one of a selection of labels to suit your channel so you can identify it easily.

Technical specifications:

Display temperature range (operational): -20 to +80 degrees C
Supply voltage: +8 to +18V. +24/28V with optional pre regulator.
Supply current: 25mA/70mA (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 Smart 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 at low cost) 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-2

The drawing on the following page shows the connections required to operate the TC-2.

Use the instruments menu system to setup the number of channels you want to use (one to four), select labels (names) for the channels and setup each channel so the bargraph shows the range of temperatures you want to measure for that channel. Finally, select the alarm level for that channel if you want it to have an alarm.
Channels are labeled TC1 to TC4.
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.

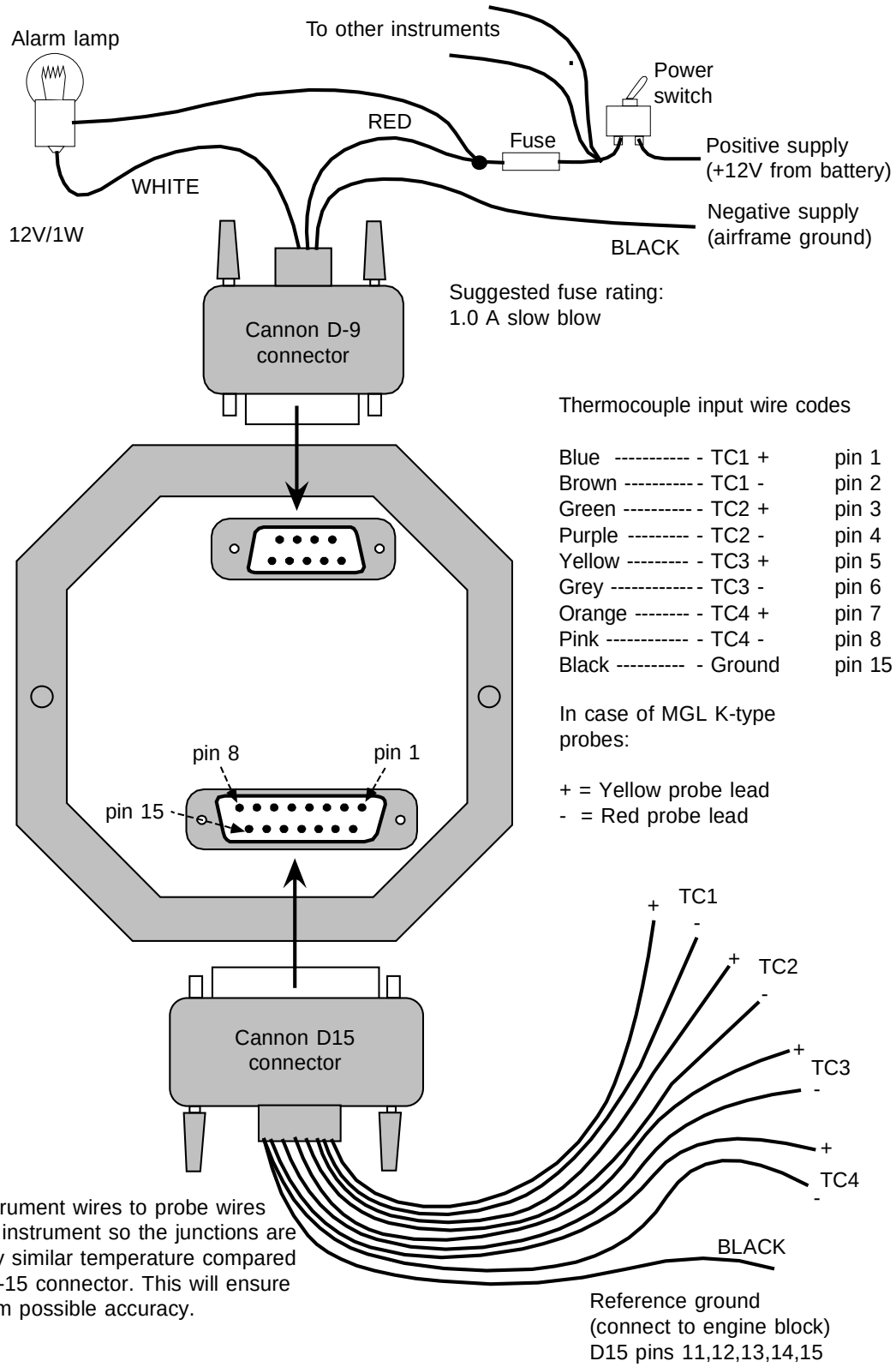
Shown is typical wiring used to connect a 12V lamp as external alarm indicator. If you have more than one instrument you can wire all contacts in parallel so you can use a single lamp if so desired.

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.



Suggested fuse rating:
1.0 A slow blow

Thermocouple input wire codes

Blue	- TC1 +	pin 1
Brown	- TC1 -	pin 2
Green	- TC2 +	pin 3
Purple	- TC2 -	pin 4
Yellow	- TC3 +	pin 5
Grey	- TC3 -	pin 6
Orange	- TC4 +	pin 7
Pink	- TC4 -	pin 8
Black	- Ground	pin 15

In case of MGL K-type probes:

+ = Yellow probe lead
- = Red probe lead

Join instrument wires to probe wires close to instrument so the junctions are at a very similar temperature compared to the D-15 connector. This will ensure maximum possible accuracy.

Reference ground
(connect to engine block)
D15 pins 11,12,13,14,15