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- Solar Panel Charge Controllers 6/8/9 & 20 Amps
- 4 & 8 Channel NMEA Combiners/RS-232 Convertors
- Engine/Exhaust Temp. Monitor & Digital Pyrometer
- Remote NMEA 0183 Data Repeater/w 4 input Channels

CruzPro®  
T-65

CE



Temperature Gauge/w  
High/Low Alarms for 3 Areas

### NMEA 0183 Sentence Description

The T65 outputs a 4800 BAUD serial data stream of Temperature (Degrees Celsius) for Sensors 1, 2 and 3 once per second.

Temperature 1: \$IIXDR,C,xxx.x,C,Z301,\*CS

Temperature 2: \$IIXDR,C,xxx.x,C,Z302,\*CS

Temperature 3: \$IIXDR,C,xxx.x,C,Z303,\*CS

\*CS = Check Sum

### Introduction

The T65 Temperature Gauge provides an accurate digital display of temperature for up to three different areas such as engine room, fish holds, live bait tanks, ocean water, refrigerator, freezer, inside cabin and outside air. Degrees F or C can be displayed.

You can set Low and High temperature alarms for each sensor independently and the T65 continuously monitors the temperature of each sensor at all times. When activated, the built-in 85 dB alarm will sound and the display will flash.

Five levels of backlighting can be selected and all setup, calibration constants and alarm values are saved in a nonvolatile memory.

An external alarm output or standard NMEA 0183 serial data output can be programmed on the screw terminal output.

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<http://www.cruzpro.com>                      [info@cruzpro.com](mailto:info@cruzpro.com)

## Notes and Warnings

- 1) Connect the first temperature sensor to screw terminal D.
2. If you have fewer than three sensors, leave the spare terminals (E and/or F) disconnected (floating).

## Specifications

**Power supply:** 9.5 to 33.0 VDC, .035 amps nom.  
**Operating temperature:** 32 to 122 F ( 0 to 50 C)  
**Range:** -20 deg F (-29 C) to +140 deg F (+60 C)  
**Size:** 2.5" dia X 4.1" deep (61mm x 104 mm)  
**Accuracy:** 1% of full scale +/- 1 degree  
**Senders:** Standard 10Kohm NTC thermistor type temperature sensor (available separately).  
**Alarms:** 85 db internal High & Low Temperature alarms, individually settable for each sensor.  
**Display:** 4 digits, Degrees F or Degrees C. Five levels of backlighting.  
**Data output:** NMEA 0183 (Standard \$IIXDR sentence). 4800 baud serial output of all three temperatures or External Alarm Output selectable.

## Selecting NMEA 0183 or External Alarm Output

The T65 comes factory preset to output NMEA 0183 compatible serial data. If you do not need this feature and would rather have an external alarm output on Screw Terminal (C), you can do so as follows:

While viewing temperature, press and hold down both the ▼ and ▲ keys for 10 seconds (until you hear a long beep). The new output mode is automatically saved to memory. When the external alarm output is activated, a 5V signal (10 mA Max.) is output on screw terminal (C).

## Setting Up and Calibration

The T65 is calibrated at time of manufacture for a nominal temperature sensor. Since calibration can vary a little from one sensor to another, you can adjust the calibration for each sensor independently by using the front panel keys.

To enter the Temperature Calibration mode, turn off the power to the T65, then press and hold down the ▼, + or ▲ key (to calibrate Sensor 1, 2 or 3) and reapply power. Use the ▲ and ▼ keys to make the displayed value read correctly. Press the + key to save the calibration data to memory.

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## Installation

*Before starting the installation, please read this entire section first. Be sure to install the bulkhead gasket before you install the instrument. Finger tighten the screws that mount the instrument bracket - do not use tools.*

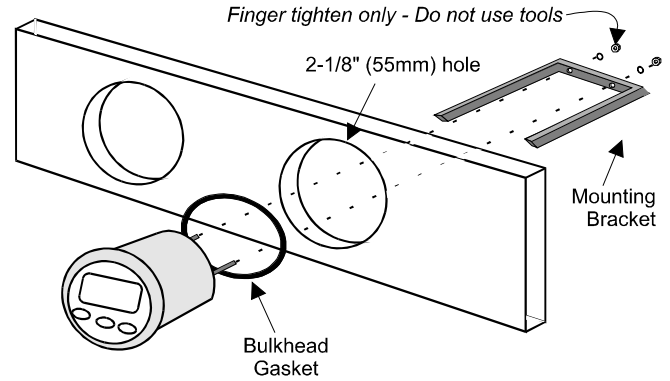


Figure 1

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## Selecting Sensor1, Sensor2 or Sensor3

Press the + or ▲ key to cycle up through the sensors (1, 2, 3, 1, 2, etc.). Press the ▼ key to cycle backwards through the sensors (3, 2, 1, 3, 2, etc). The icon near the "1", "2" or "3" on the LCD display will indicate which sensor is being monitored.

## Setting High/Low Temperature Alarms

While viewing temperature for the desired sensor (1, 2 or 3), press and hold the ▼ or ▲ key for ten (10) seconds to set the Low or High alarm value. You will hear a long beep and the low/high level alarm value for that sensor will be displayed. Press the ▲ and ▼ keys to set the desired alarm limit. Press the + key to save your entry. The default low alarm settings are -20 degrees F and +140 degrees F.

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driver to make the connections to the screw terminal on the instrument case back as shown in figures 2 and 3.

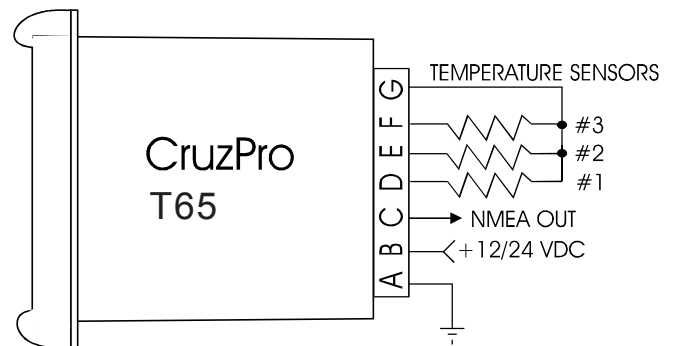
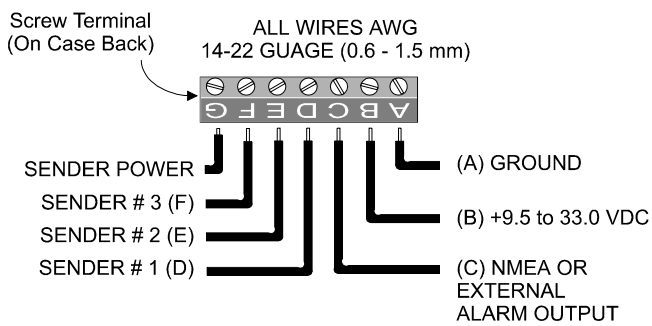


Figure 3

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## Mounting and Wiring

- Drill a 2-1/8" (55mm) mounting hole where you desire to mount the instrument (Figure 1).
- Bring the sender wires, ground, and power lines out of the mounting hole and use a small flat screw-



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Figure 2

## Alarms ON/Off

While viewing temperature for sensor 1, 2 or 3, press the ▲ or ▼ key for 1/2 second to "arm" or "disarm" all the alarms simultaneously. The display will blink the 1, 2 or 3 icon when the alarms are armed. You should leave the alarms armed at all times and only disarm it to silence the alarm buzzer.

## Selecting Degrees F or Degrees C

To switch between displaying degrees F or C, turn off the power to the T65, then press and hold down both the ▼ and ▲ keys and reapply power. Your selection will automatically be saved to memory.

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- Carefully check all your wiring against those shown in figure 2. If everything is wired correctly you can mount the T65 in the instrument hole. Be sure the bulkhead gasket is in place and use only finger tension to tighten the bracket hold-down nuts. *Do not over-tighten the bracket or you may damage the case - do not use tools to tighten the nuts.*

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## Operation

### Key Functions

The ▼, + and ▲ keys are used to select backlight levels, select sensor to display (in degrees F or C), set low and high temperature alarms and calibrate the instrument to the sensor. After changes are made, the new information is automatically saved to nonvolatile memory.

### Backlight Intensity

Press the + key for 1/2 second to adjust the backlight level for nighttime viewing. Each time you press the + key for 1/2 second, the backlight level will change 1, 2, 3, 4, OFF, 1, 2, ... etc.

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