

BHM Electronics

Temperature Display Instruction Manual



model TMGD-1

Overview

The Temperature Display receives temperature data from an NMEA data sender and shows on its screen the present temperature and a graph of temperature over time.

An NMEA data sender is a device which sends temperature data in the NMEA0183 format. This includes the BHM Temperature Junction Box and many modern echo sounders and boat instruments.

Packing List

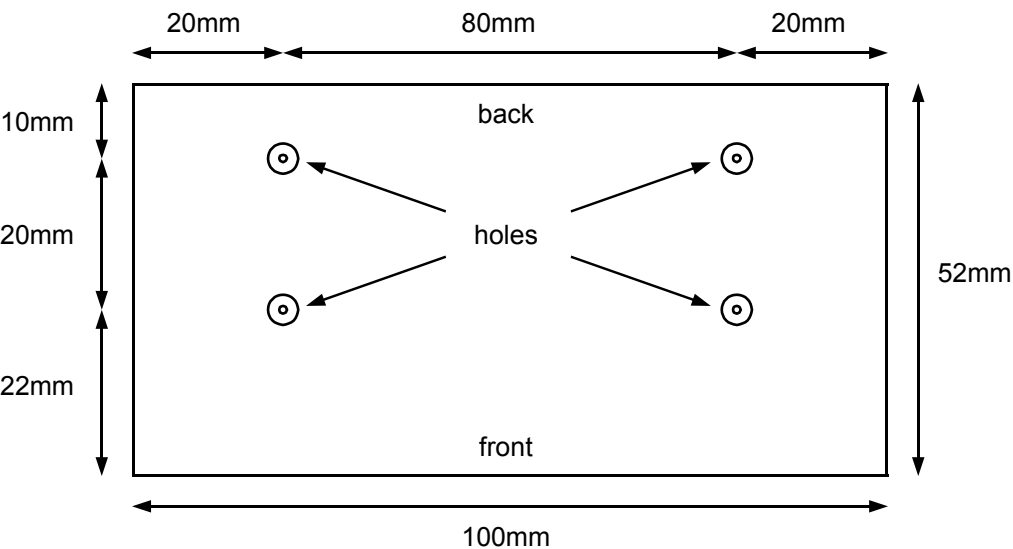
- 1 Instruction Manual
- 1 Temperature Display, model TM-GD-1
- 1 2-metre power and data cable
- 1 mounting bracket, attached to display
- 4 M3x20 screws with washers, attached to display
- 4 #6 x 1/2" self tapping screws

Display Installation

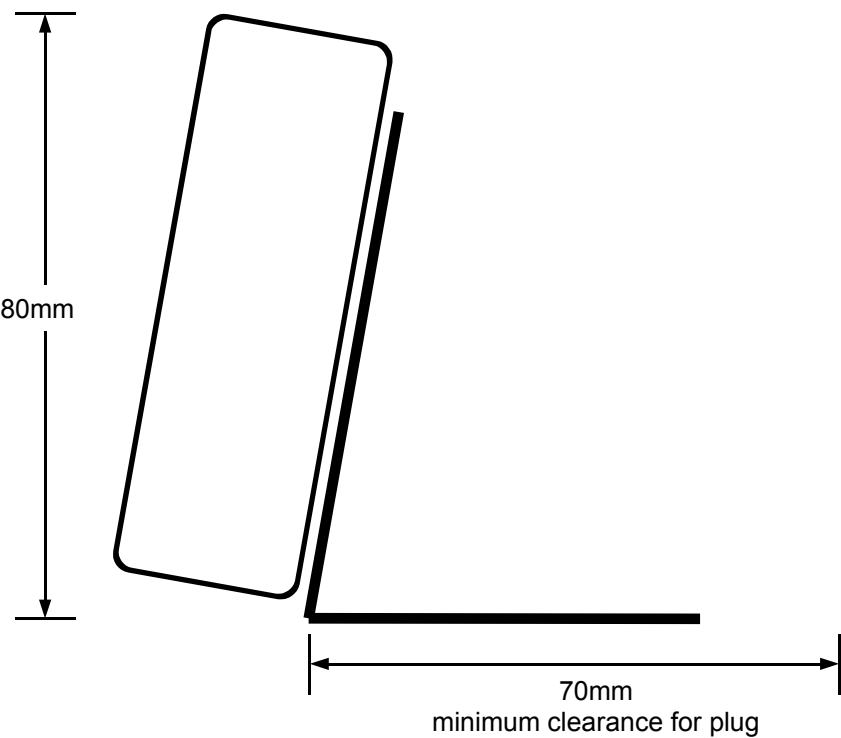
Bracket Mounting

The Display is supplied with a mounting bracket attached. For overhead mounting the bracket can be removed and turned around.

Display Bracket Drilling Pattern



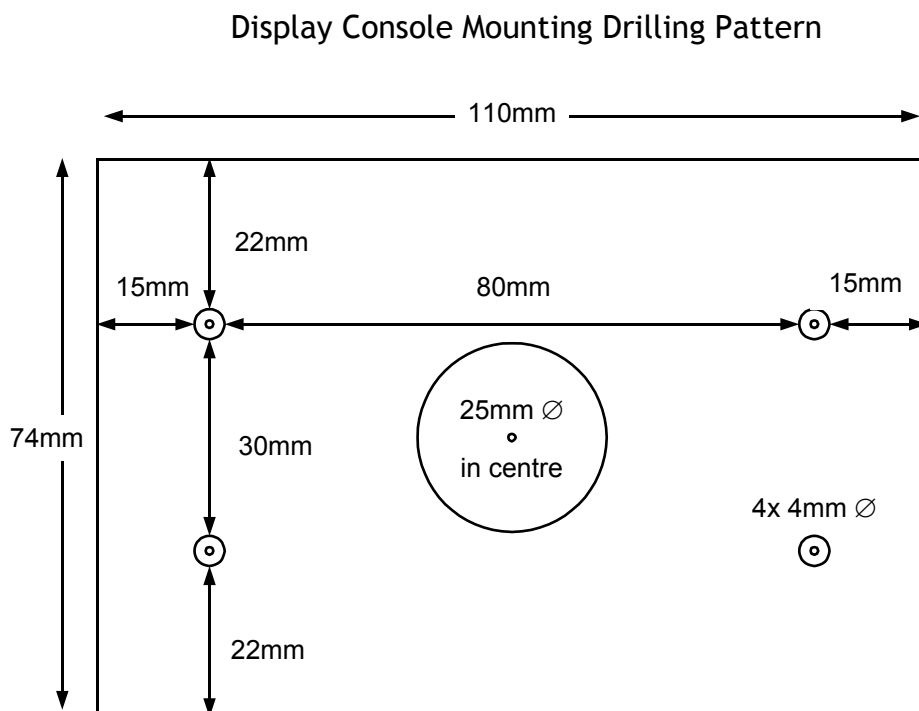
Side View of Bracket Mounting



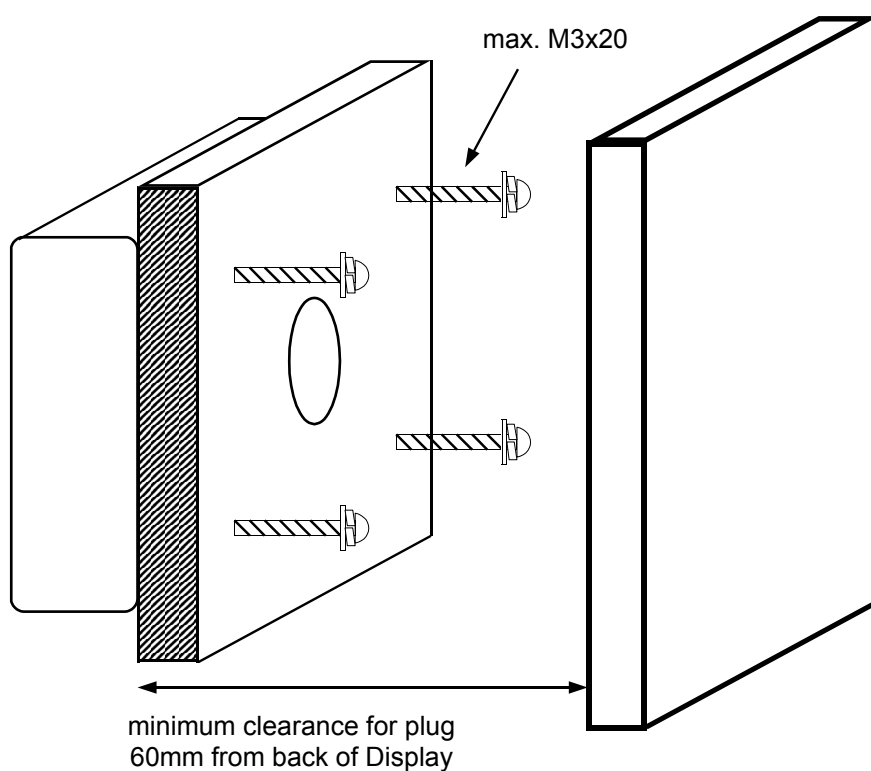
Console Mounting

The Display can be mounted directly on a flat surface by removing the bracket.

Drill mounting holes using the pattern below. Bring the connector end of the Display cable through the central hole and plug it into the back of the Display. Mount the Display using the screws removed from the bracket.



Rear View of Console Mounting



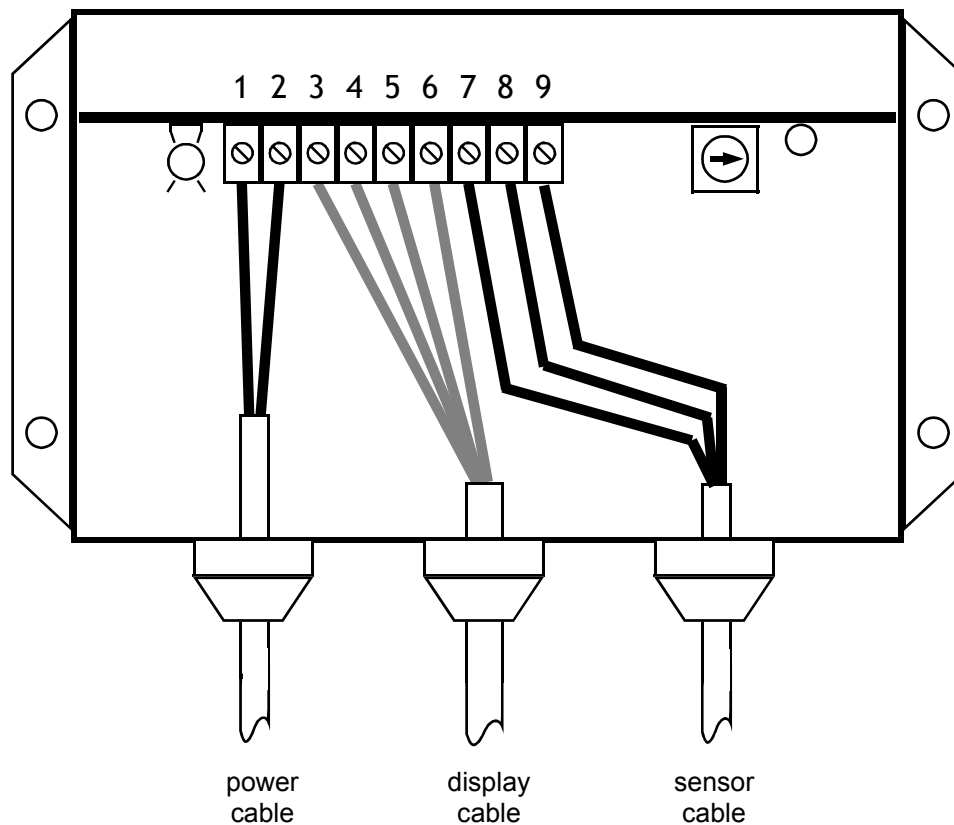
Temperature Display Wiring with Junction Box

Wiring is simplified when using the BHM Temperature Junction Box since the Junction Box can supply both data and power to the Temperature Display. See the manual which comes with the Temperature Junction Box for more details.

The screw terminals are numbered starting at the fuse end of the Junction Box circuit board.

terminal	cable/ colour	function
1	power/red	power in +
2	power/black	power in -
3	display/white	power out +
4	display/black	power out -
5	display/orange	NMEA data out +
6	display/green	NMEA data out -
7	sensor/white	sensor power +
8	sensor/brown	sensor data
9	sensor/shield	sensor power -

Temperature Junction Box Terminal Wiring



Temperature Display Wiring without Junction Box

The Temperature Display can be used without the Temperature Junction Box if another temperature data source is available, for example from an echo sounder or boat instrument with its own temperature sensor.

The cable wiring colour code is:

Display connector	cable colour	function
pin 1	white	positive 8V to 30V power
pin 2	black	negative power
pin 3	orange	NMEA data in +
pin 4	green	NMEA data in -

Power

The Temperature Display requires a DC power supply of between 8 and 30 volts. A 0.5 amp fuse must be fitted in the positive lead.

Temperature Data

A cable must be run from the NMEA output connector of the temperature sender to the NMEA data inputs of the Temperature Display. You will need to consult the manual for the sending device to find the correct connector and wiring to use.

The NMEA data output must include an MTW sentence, the standard sentence used for sending temperature data.

Final Set-up and Testing

After all the units are mounted and connected together connect the Junction Box power cable to the power supply, or if the Temperature Display is being used without the Junction Box connect the Temperature Display to the power supply.

Press the power button to turn the Temperature Display on. The Temperature Display should show 'BHM Electronics' and the software version such as 'Temperature 1.0' for a few seconds, then it will start displaying the temperature in large figures along with a graph.

If no temperature data is received for more than a few seconds the Temperature Display will show 'No Data'.

NMEA Test Mode

For trouble shooting the Temperature Display can be put into an NMEA test mode to view the incoming NMEA sentences. Turn the Temperature Display on then hold down the °C/°F button until the Temperature Display shows 'NMEA Test Mode'. The Temperature Display should now show all NMEA data sentences being sent to it. Press the °C/°F button to start or stop the data scrolling and the power button to leave the test mode.

The temperature data must be sent in an MTW sentence, using the NMEA0183 format of 4800 bits per second, with no parity and one stop bit.

The sentence should look similar to this: **\$IIMTW,19.72,C*2E**

\$=start of sentence

II=sender identifier, differs depending on sending equipment

MTW=water temperature sentence identifier

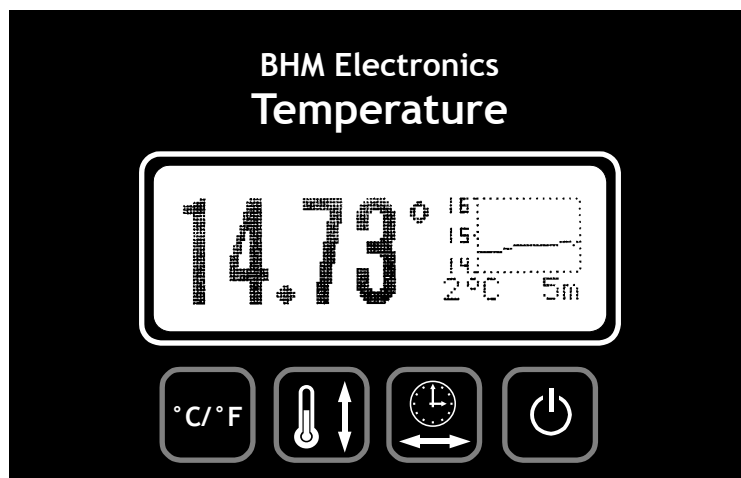
19.72=temperature

C=degrees Celsius

=optional sentence checksum follows

2E=checksum value, will vary depending on rest of sentence

Operating Instructions



scale temp. time power
range range range

Display

The temperature is shown in large figures on the left of the screen and as a graph plotted over time on the right. The lower and upper ranges and the centre temperature are marked on the left side of the graph. Under the bottom left of the graph is the temperature range the graph is set to (in this example 2 degrees) and the temperature scale in use (Celsius). Under the bottom right is the time range the graph is using. The right end of the line drawn on the graph is the most recent temperature reading while the left end is the oldest temperature, in this example from 5 minutes ago.


Power Button

Press the power button to turn the Temperature Display on. Press and hold the power button for about one second to turn it off.


Temperature Scale Button

Press the °C/°F button to change the temperature scale between degrees Celsius and degrees Fahrenheit. The temperature range under the graph indicates the scale currently in use.

Graph Temperature Range Button

Press the thermometer button  to change the vertical temperature scale on the graph. For short time ranges the temperature range can normally be left on 2°, but over longer periods the temperature may change too much for the graph to display the entire record. Successive button presses will change the temperature range from 2 to 4 to 8 to 16 degrees, and back to 2 degrees.

Graph Time Range Button

Press the clock button  to change the horizontal time scale on the graph. The time range can be set to periods between 1 minute and 24 hours. When set to 1 minute the graph updates every two seconds and is useful for spotting quickly changing temperatures. Successive button presses will change the time range from 1 minute to 5 minutes to 15 minutes to 1 hour to 24 hours, and back to 1 minute.

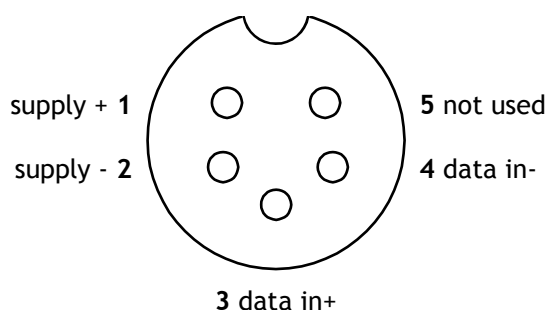
Technical Information

BHM Temperature Display, model TMGD-1

supply voltage	8V to 30V DC
current	70mA at 12V, 35mA at 24V

Display Connector

The connector on the back of the Display is a 5-pin male chassis round metal 'microphone' plug. Looking at the chassis connector or the back of the cord socket pin 1 is located anticlockwise from the alignment notch.



Manufactured by
BHM Electronics
Invercargill
New Zealand

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