

BHM Electronics

Temperature Junction Box Instruction Manual



model TMJB-1

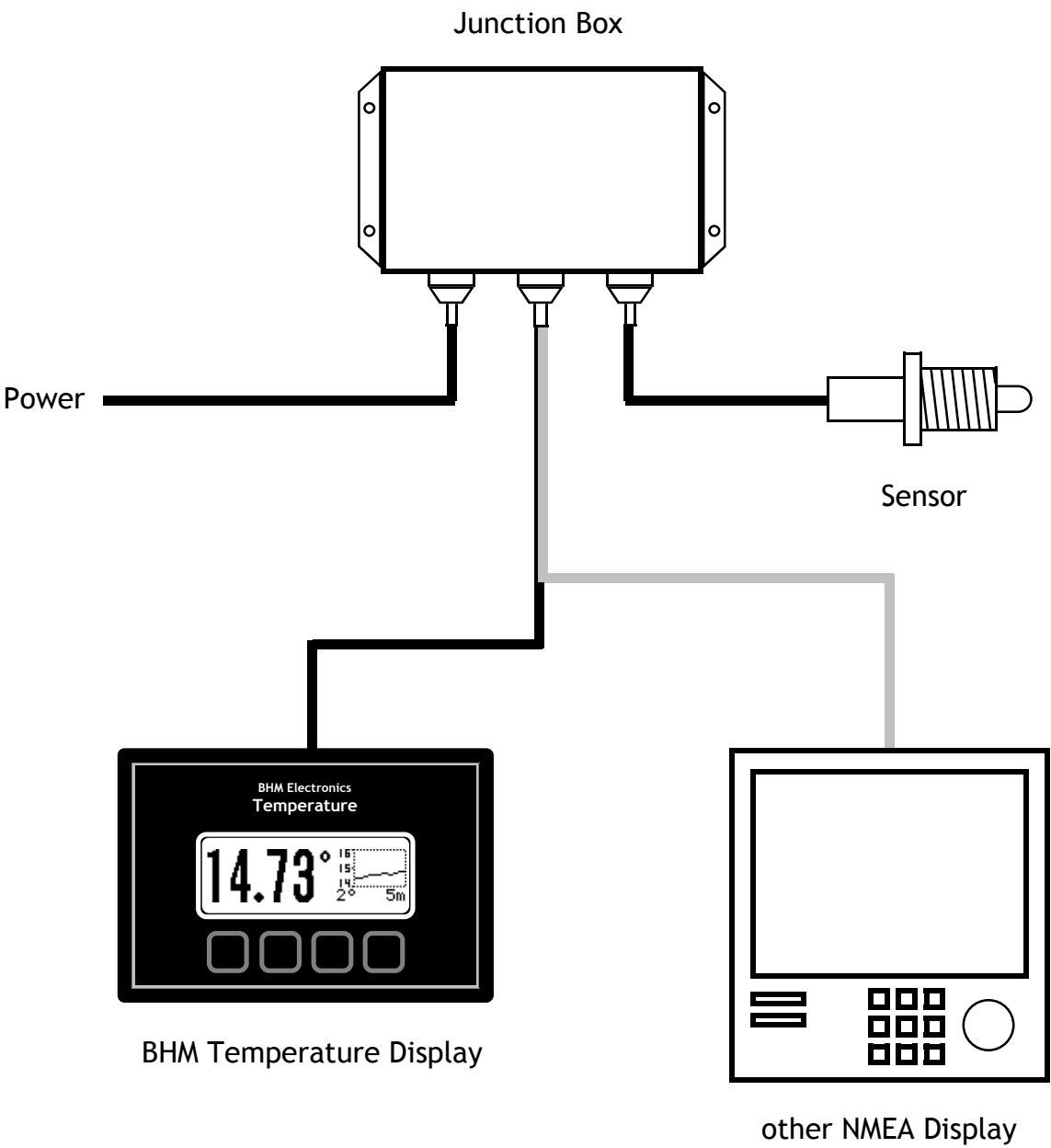
Overview

The BHM Temperature Junction Box connects to a BHM Temperature Sensor and sends the temperature reading to a display device. The display can be either a BHM Temperature Display or another device with can accept NMEA data, such as an echo sounder or GPS plotter.

Packing List

- 1 Instruction Manual
- 1 Temperature Junction Box, model TMJB-1
 with 2-metre power cable
- 4 #6 x 1/2" self-tapping screws

Interconnection



Junction Box Installation

Location

The Junction Box is not water proof and must be mounted out of the weather.

Connections

Loosen the four screws from the top to remove the cover from the Junction Box.

The wiring terminal connections are shown on the next page.

Power

Run the supplied white power cable to a power source (12 or 24 volts DC) via a fuse or circuit breaker. Do not connect it to the power until the installation is complete. The Junction Box does not need a power switch as it uses a minimal amount of power and can be left running permanently. A fuse or circuit breaker is required though to allow for power to be disconnected if servicing is required and to protect the wiring between the power source and the fuse inside the Junction Box.

Sensor

Mount the Temperature Sensor in position and run the cable back to the Junction Box. See the instructions which come with the Sensor for mounting details.

Display

If using the BHM Temperature Display run the cable provided with the Display from the position the Display will be mounted in back to the Junction Box.

NMEA

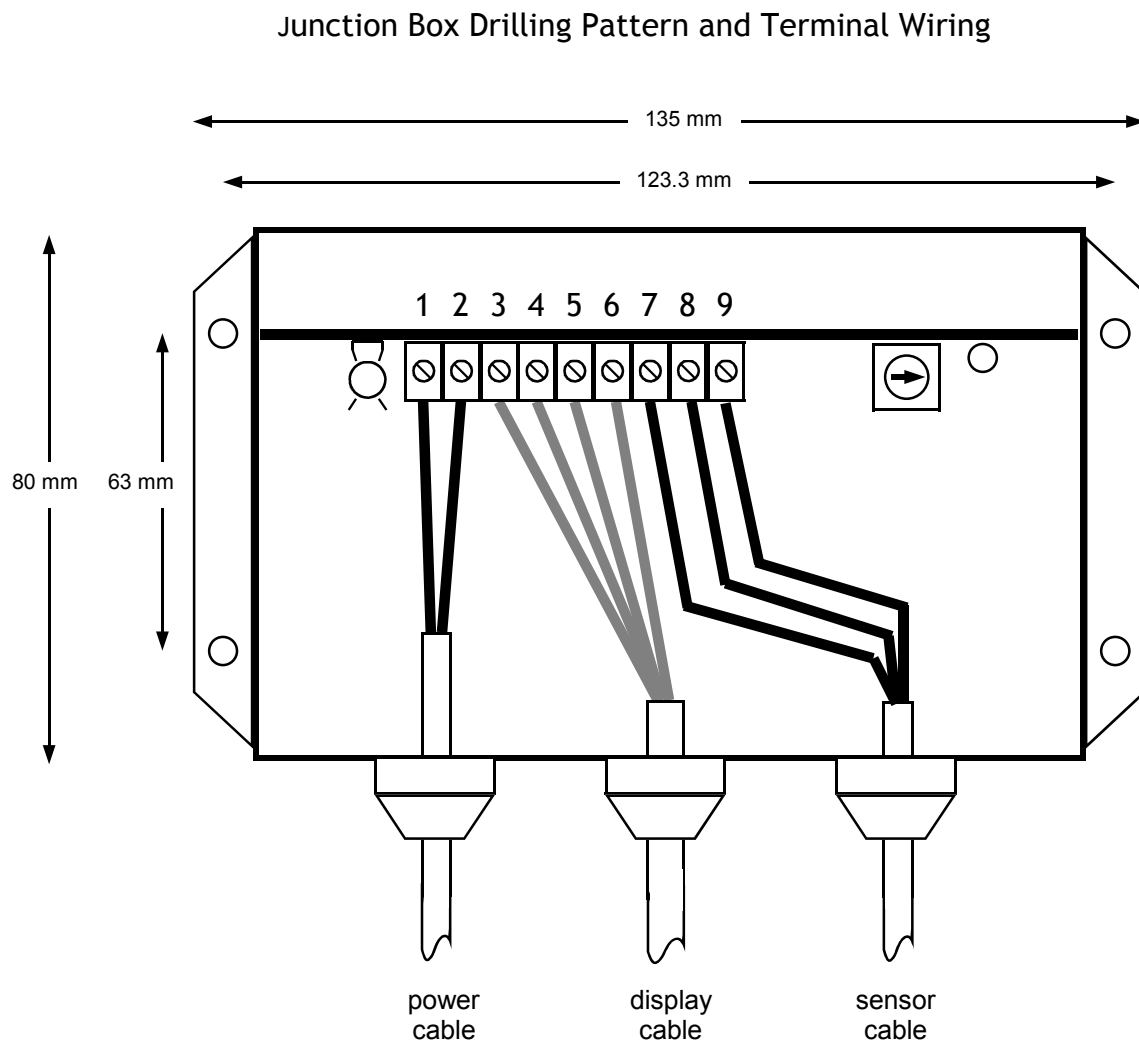
The Junction Box can be used to supply temperature data to any device capable of receiving the NMEA MTW sentence. The NMEA output terminals are labelled NMEA data out+ and NMEA data out- on the next page. These are the same two outputs which send the temperature data to the BHM Temperature Display. The Junction Box can drive a Temperature Display and up to two standard NMEA receivers in parallel.

When replacing the Junction Box cover make sure the red indicator light fits through the small hole in the cover.

Junction Box Wiring

The screw terminals are numbered starting at the fuse end of the 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 -



Final Set-up and Testing

After the Temperature Sensor and Temperature Display or other NMEA receivers are connected into the Junction Box, connect the Junction Box power cable to the power supply.

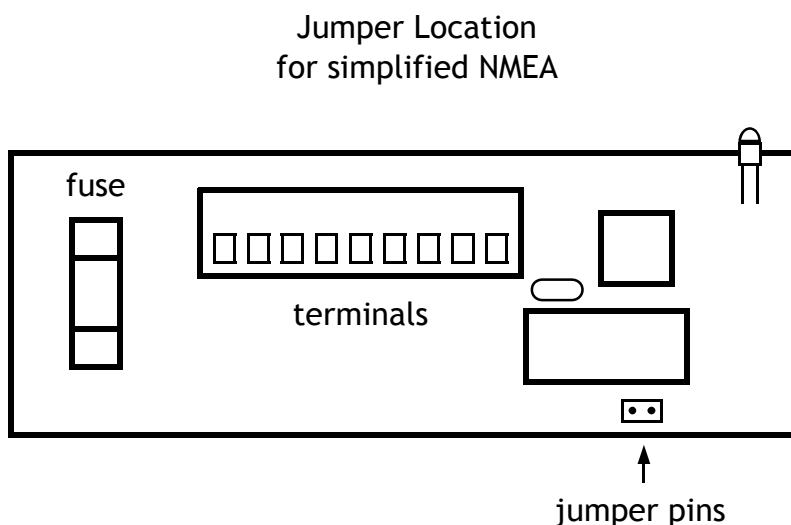
As soon as power is present the red indicator light on the cover of the Junction Box will start flashing at one second intervals. Each flash indicates a reading of the Temperature Sensor. If the Junction Box can not detect a Sensor the indicator will give a short flash followed by a long flash. If this happens check that the Sensor is connected properly.

NMEA Data Output

Check that the temperature is being sent to the receiving device. For the BHM Temperature Display just turn the Display on and the temperature should show.

If the NMEA receiving device does not show the temperature first check that it is set up to do so. Some devices have to have the option turned on or the NMEA input port selected in a menu.

If the temperature is still not being received, or is showing incorrect readings, the Junction Box can be set to send a simplified version of the NMEA sentence. By default the Junction Box sends the temperature with two decimal places of precision and with sentence error checksums. Some receivers, especially older equipment, may not handle this properly. A jumper can be fitted to the circuit board inside the Junction Box to enable the simplified output format. A standard 0.1-inch jumper can be placed across these pins at the location shown in the drawing below. The jumper can be fitted or removed safely with the Junction Box running.



Temperature Adjustment

The Temperature Sensor is calibrated at the factory. The temperature reading sent from the Junction Box can be further adjusted, either for accuracy against a known calibrated source or to match another temperature meter.

Remove the cover from the Junction Box. The adjustment is made with a rotary switch located right beside the red indicator light. Use a small screw driver to rotate the pointer on the switch. The adjustment can be made while the Junction Box is running.

The adjustment switch has 16 positions, labelled from 0 to 9 then A to F, allowing an adjustment of -0.8°C to $+0.7^{\circ}\text{C}$. The table below shows the adjustment for each position.

adjustment	position
-0.8	8
-0.7	9
-0.6	A
-0.5	B
-0.4	C
-0.3	D
-0.2	E
-0.1	F
+0.0	0
+0.1	1
+0.2	2
+0.3	3
+0.4	4
+0.5	5
+0.6	6
+0.7	7

Technical Information

BHM Temperature Junction Box, model TM-JB-1

supply voltage	10 V to 28 V DC
maximum current	5 mA without / 100 mA with BHM Temperature Display
internal fuse	500 mA, M205

NMEA Sentence Format

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

The normal sentence format is: **\$IIMTW,19.72,C*2E**

The simplified sentence format is: **\$IIMTW,19.7,C**

\$=start of sentence
II=sender identifier, II for integrated instrument
MTW=water temperature sentence identifier
19.72=example temperature
C=degrees Celsius
*=optional sentence checksum follows
2E=example checksum value

Manufactured by
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New Zealand

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