DTL84 DATA LOGGER THERMOMETER

INSTRUCTION MANUAL

T1 T2 T3 T4

MARTINDALE ELECTRIC

DTL84 DATALOGGER THERMOMETER

TYPE
K   HOLD
T1   23.2 °C
T2   24.2 °C
T3   - - - - °C
T4   - - - - °C

MARTINDALE ● ● ● ● ELECTRIC

⚠ **ALWAYS READ THESE INSTRUCTIONS BEFORE PROCEEDING**

Thank you for buying one of our products. For safety and a full understanding of its benefits please read this manual before use. Technical support is available from 01923 441717 and support@martindale-electric.co.uk.

CONTENTS

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1. SAFETY INFORMATION

⚠ **REMEMBER: SAFETY IS NO ACCIDENT**

These instructions contain both information and warnings that are necessary for the safe operation and maintenance of this product. It is recommended that you read the instructions carefully and ensure that the contents are fully understood. Failure to understand and to comply with the warnings and instructions can result in serious injury, damage or even death.

Particular attention should be paid to the Warnings, Precautions and Technical Specifications.

Please keep these instructions for future reference. Updated instructions and product information are available at: www.martindale-electric.co.uk

1.1 Meaning of Symbols and Markings

⚠   **Caution - refer to instructions**

CE   **Equipment complies with relevant EU Directives**

🗑   **End of life disposal of this equipment should be in accordance with relevant EU Directives.**

1.2 Precautions

This product has been designed with your safety in mind, but please pay attention to the following warnings and cautions before use. Do not use if battery cover is not fitted.

⚠ **Warnings**

In order to avoid the danger of electric shock, it is important that proper safety measures are taken when working with voltages exceeding 30V AC rms, 42 AC peak of 60V DC.

The DTL84 must only be used by a skilled and competent person who is familiar with the relevant regulations, the safety risks involved and the normal safe working practices, and under the conditions and for the purposes for which it has been constructed and specified.

Before use check the unit for cracks or other damage. Make sure the unit is free from dust, grease and moisture. Also check any associated probes and accessories for damage. Do not use if damaged.

To avoid electric shock, and damage to the instrument, do not use this instrument and the associated temperature probes when voltage at the measurement surface exceeds 30V DC or AC rms.

⚠ **Cautions**

To avoid burns or damage to equipment, do not take temperature measurements inside microwave ovens.

Repeated sharp flexing can break the thermocouple leads. To prolong lead life, avoid sharp bends in the leads, especially near the connector.

Avoid severe mechanical shock or vibration and extreme temperature.

To avoid possible corrosion from leaking batteries, remove the batteries if discharged, or when the unit is not in use for an extended period.

2. INTRODUCTION

2.1 Inspection
Examine the shipping carton for any sign of damage. Inspect the unit and any accessories for damage. If there is any damage then consult your distributor immediately.

2.2 Description
The DTL84 has the following functions and features:
- Four channel inputs
- Selectable thermocouple type (K, J, E, T, N, R, S)
- Differential temperature measurement
- Temperature alarm function
- Fast response and sampling rate
- Instant recall function
- Adjustable auto power off
- Bluetooth connection to PC or mobile device
- iOS & Android APP available to download from APP store
- USB PC interface with Windows software included.

2.3 Accessories
The DTL84 comes with the following accessories:
- 2 x K-type thermocouples
- Bluetooth adaptor
- 4 x 1.5V AAA LR03 batteries
- DTL84 software CD
- Micro USB cable
- Storage case
- Instructions

2.4 Battery Installation
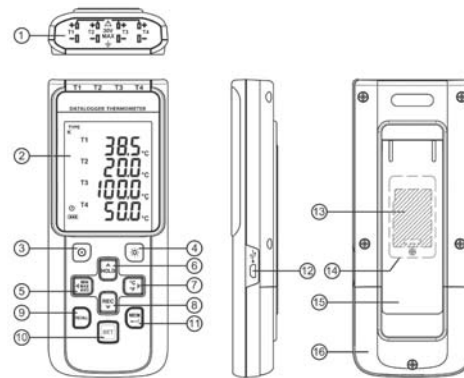Refer to Section 6.1 (Battery Replacement).

2.5 Bluetooth Adaptor Installation
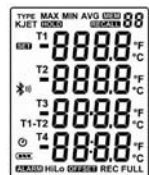Refer to Section 6.2 (Bluetooth Adaptor Installation).

3. OPERATION

3.1 Description of Press Buttons and DTL84 Elements

1		Thermocouple input sockets
2		LCD display
3	①	Turns the DTL84 on/off
4	※	Turns the backlight on/off
5	MIN MAX AVG	Selects max, min or average readings
6	▲ HOLD	Selects the data hold function
7	°C °F ▶	Selects the temperature scale
8	REC ▼	Starts/stops the record function
9	RECALL	Recalls saved readings
10	SET	Enters/exits Set-up function
11	MEM ←	Saves readings to the memory
12		USB interface
13		Bluetooth adaptor
14		Bluetooth adaptor compartment
15		Tilt stand
16		Battery compartment

3.2 Description of LCD symbols

▭	Indicates low battery
MIN	Minimum recorded value is displayed
MAX	Maximum recorded value is displayed
AVG	Average reading is displayed
SET	Setup option indicator
⏱	Auto power off is active
REC	Indicates recording is active
FULL	Memory full indicator
MEM 88	Indicates memory location of stored data
RECALL 88	Indicates memory location when recalling stored data
TYPE KJET	Indicates selected thermocouple type
T1 T2 T3 T4	Temperature channel
T1-T2	T1-T2 differential temperature mode selected
ALARM	Indicates temperature alarm selected
Hi	Indicates high temperature alarm tripped
Lo	Indicates low temperature alarm tripped
OFFSET	Probe error compensation
°C°F	Indicates temperature scale
HOLD	Display hold mode is active
n	N-type thermocouple is selected
r	R-type thermocouple is selected
S	S-type thermocouple is selected
✳	Bluetooth pairing/standby
✳»	Bluetooth connected

3.3 Low Battery Indication
If the ▭ symbol is displayed, the battery needs replacing as measurement accuracy can no longer be guaranteed (See section 6.1 Battery Replacement).

3.4 Power On/Off
Press ① to power on the meter. Press and hold ① for 3 seconds to power off.

3.5 Backlight
Press ※ to turn on the display backlight. Press ※ again to turn off the backlight.
It will automatically turn off after 30 seconds if there is no further operation of the meter.

3.6 Data Hold
To hold displayed readings, press ▲ HOLD The HOLD symbol will be displayed.
Press again to exit the Data-Hold mode.
Note: When Data-Hold mode is selected the MIN MAX AVG, °C °F▶, RECALL, SET buttons are disabled.

3.7 Record Function
Measurement data recorded at set time intervals can be saved to the internal memory. Refer to 4.4 (Setting Data Recording Interval Time) to set the required time interval.
Press REC ▼ to start recording data. The **REC** symbol will be displayed.
To stop recording, press REC ▼ again.
The recorded data can be downloaded to a PC using the DTL84 software.

Note:
- During recording, the °C °F▶ and SET buttons are disabled so any required settings need to be selected before starting the data logger function.
- When the memory is full (32,000 results), the "**FULL**" symbol will flash on the LCD. The data logger function will stop.
- When the battery power is low, the ▭ symbol appears on the screen and the data logger function will not start. If the battery is running low during data logging, it will stop recording automatically.

3.8 Memory Function
Press MEM ← to save the current displayed temperature readings to memory. The MEM symbol and the number of the memory location will appear on the screen for 2 seconds.
Press MEM ← again to store further sets of results.
The memory has 0-99 locations.

3.9 Recalling Saved Results
Press RECALL to recall saved results. The RECALL symbol and the number of the last used memory location will be displayed.

The time the data was save will be displayed in hours, mins, secs for 2 seconds before the saved temperature readings are displayed.

Press the arrow keys ▲ HOLD, REC ▼, MIN MAX AVG, °C °F▶ to select the required memory location.
Press RECALL or ① to exit RECALL mode.

Note: When the DTL84 is connected to an external device (PC, laptop, tablet etc), the recall function is disabled.

3.10 Max/Min/Avg

When this function is selected, the DTL84 simultaneously monitors and stores the maximum, minimum and average results. The DTL84 will continue to update and refresh the data until the user exits this function

To enter the function and display the maximum recorded value, press [MIN MAX AVG]. The **MAX** symbol will be displayed.

Successive presses of [MIN MAX AVG] will display the following in sequence:

The minimum recorded value. The **MIN** symbol will be displayed.

The average recorded value. The **AVG** symbol will be displayed

Real time readings [MIN MAX AVG]. The **MAX**, **MIN** and **AVG** symbols flash.

To exit MAX/MIN/AVG, press [MIN MAX AVG] and hold for 2 seconds.

3.11 Temperature Scale Selection

Press [°C °F ►] to switch between Celsius (°C) and Fahrenheit (°F)

3.12 Temperature Measurement

The maximum temperature measurement of the DTL84 for a K-type thermocouple is 1372°C. The K-type thermocouple probe supplied is specified to 200 °C. Be sure that the thermocouple probe is adequate for the measurement being made.

Connect a thermocouple probe/s, suitable for the type of temperature measurement and temperature range being made, to the thermocouple input socket/s.

Set the DTL84 for the selected thermocouple type (see 4.3).
Taking all necessary safety precautions position the thermocouple/s at the surface or in the medium to be measured and read the measured temperature from the display.

Note: Repeated flexing can break the thermocouple leads. To prolong lead life, avoid sharp bends in the leads, especially near the connector.

3.13 Differential Temperature Measurement

Connect thermocouple probes, suitable for the type of temperature measurement and temperature range being made, to the thermocouple input sockets T1 and T2.

Set the DTL84 to the T1-2 differential temperature mode (see 4.7) and the selected thermocouple type (see 4.3).

Taking all necessary safety precautions position the thermocouples at the surfaces or in the mediums to be measured.

The difference between the measured temperatures of thermocouples T1 and T2 will be displayed at the bottom of the LCD.

4. Set-up

Press [SET] to enter set-up. Press [SET] again to exit set-up.

Note: When the DTL84 is connected to the user's chosen device (PC, laptop, tablet etc), set-up cannot be entered.

Press the arrow keys [▲ HOLD] [REC ▼] [MIN MAX AVG] [°C °F ►] to select settings and to adjust parameters.
Press [◄─] to save changes and move to the next set-up option.

4.1 Set Bluetooth ON/OFF

Press [▲ HOLD] or [REC ▼] to turn the Bluetooth ON or OFF.

Note: When switching the Bluetooth function ON or when entering the standby/pairing mode, the blue LED in the [SET] button flashes every 3 seconds. When successfully connected, the blue LED will flash every second.

4.2 Select Thermocouple Type

The DT84 can be set for the following thermocouple types: K, J, E, T, N, R and S.
Press [◄ MIN MAX AVG] or [°C °F ►] to select the thermocouple type.

4.3 Setting the Data Recording Interval Time

Press [MIN MAX AVG] or [°C °F ►] to set the minutes and/or seconds.
Press [▲ HOLD] or [REC ▼] to increase/decrease the values.

Note: The set interval time range is 1 second (00:01) to 60 minutes 59 seconds (60:59).
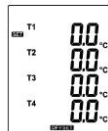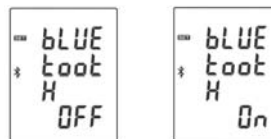
4.4 Thermocouple Offset Adjustment

The offset adjustment allows an individual thermocouple to be optimised for the best measurement accuracy at a chosen reference temperature.
Press [MIN MAX AVG] or [°C °F ►] to select the required thermocouple channel and it will flash on the LCD when selected.

Press [▲ HOLD] or [REC ▼] to increase/decrease the values.

The offset adjustment span is ± 5°C or ± 9°F

4.5 Setting the Alarm Limits (T1 only)

Press [▲ HOLD] or [REC ▼] to switch ON or OFF.

When setting the alarm point, select ON and then press [MEM ◄─] to set the **Hi** and **Lo** limit.

Note: If the alarm limits are exceeded, the LCD will flash **ALARM Hi** or **ALARM Lo** and the audible sounder will beep continuously.
The **Lo** alarm setting cannot be greater than the **Hi** alarm setting.

4.6 Set T1-T2 Differential mode

Press the [▲ HOLD] or [REC ▼] buttons to switch the differential mode ON or OFF.

Note: When the T1-T2 differential mode is ON, the T1-T2 measurement will be displayed at the bottom of the LCD.

4.7 Set Auto Power Off Time

Press [▲ HOLD] or [REC ▼] to switch the auto power off function ON or OFF. The function is OFF when no time is selected.
The following auto power off times can be selected - 10 or 30 minutes, 1, 2, 4, or 8 hours. The ON symbol will appear above the selected time.

4.8 Set System Clock

The DTL84 has a built in clock so that the data logger function can also record the date and time as well as the measured value.

Press [MIN MAX AVG] or [°C °F ►] to select the year, date and time.
Press [▲ HOLD] or [REC ▼] to increase/decrease the values.

Note: It is advisable to check the system clock settings after replacing the batteries. If necessary, reset the clock settings.

4.9 Clearing Data Logger Records

Switch off the DTL84. Press and hold [REC ▼] and then press [⏻] to power up the meter. Keep holding both buttons and **REC, CLr, SUrE**, and 5 will appear on the LCD. Continue to hold both buttons until 5 counts down to 0. To abort clearing the memory release both buttons before the DTL84 counts down to 0. After the memory has been cleared the DTL84 will return to measurement mode.

4.10 Clearing instant Read-out Memory

Switch off the DTL84. Press and hold [MEM ←] and [⏻] to switch the meter back on. Keep holding both buttons and **MEM**, **CLr**, **SUrE**, and **5** will appear on the LCD. Continue to hold both buttons until 5 counts down to 0.

The LCD will show CLr, 0 and will start erasing the stored results from 00 to 99. When all of the stored records are deleted, release both buttons and the DTL84 will return to measurement mode.

5. Connecting to a PC using the DTL84 software

The DTL84 can be connected to a PC via the micro USB cable or the Bluetooth adaptor to download the recorded data or perform real time monitoring or data logging using the DTL84 software.

5.1 System Requirements

Windows XP, VISTA, Windows 7, Windows 8, Windows 10.

5.2 Minimum Hardware Requirements

PC or laptop with CD-ROM drive.
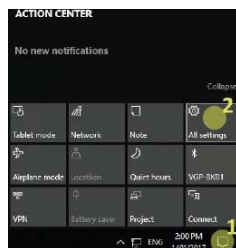At least 50MB hard disk space available to install DTL84 software.
Recommended screen resolution 1024 x 768.

5.3 Quick Start Tutorial

For guidance on the use of the DTL84 software there is a quick start tutorial within the HELP of the DTL84 software.

5.4 Bluetooth pairing using the Windows 10 Action Centre (Windows 10)

1) Open **Action Centre**
2) Click **All Settings**
3) Click on **Devices**
4) Select **Bluetooth**
5) Turn On
6) Select BT XXXXXXXX (serial number of adaptor)
7) Click **Pair**
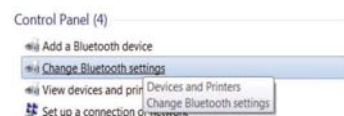8) After installing, the device will appear as paired

5.5 Bluetooth pairing using the Windows Control Panel

1) Click **Start** and then click **Devices and Printers**
2) Click **Add a Device**
3) Choose Bluetooth Adaptor then click **Next**.

4) To find out which COM port has been allocated to the meter, click on the Windows Start button and search for "Bluetooth" and choose "Change Bluetooth settings."

Control Panel (4)
- Add a Bluetooth device
- Change Bluetooth settings
- View devices and printers — Devices and Printers / Change Bluetooth settings
- Set up a connection or network

Click on the COM ports tab to see which port has been allocated to the meter.

6. MAINTENANCE

6.1 Battery Replacement

The battery compartment is underneath the unit and can be accessed by undoing the screw.
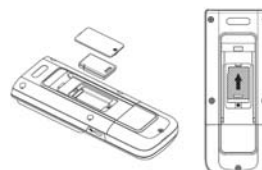

Fit 4 new 1.5V, AAA alkaline batteries (IEC LR03, NEDA 24A) observing correct polarity. Replace the battery cover and the screw.

Note: Do not mix old and new batteries.

6.2 Bluetooth Adaptor Installation

Before installing the Bluetooth adaptor, switch the DTL84 off. The Bluetooth adaptor compartment is underneath the unit and can be accessed by undoing the screw.

Place the adaptor into the compartment and gently push in an upwards direction ensuring the pins are lined up with the connector. Replace the cover and the screw.

6.3 Calibration

To maintain the integrity of measurements made using your instrument, Martindale Electric recommends that it is returned at least once a year to an approved Calibration Laboratory for recalibration and certification.

Martindale Electric is pleased to offer you this service. Please contact our Service Department for details. Email: service@martindale-electric.co.uk. Tel: 01923 650660

6.4 Cleaning

If contamination is found, clean with a damp soft cloth and if necessary a mild detergent or alcohol. Do not use abrasives, abrasive solvents, or detergents which can cause damage to the unit. If a mild detergent is used, the unit should subsequently be thoroughly cleaned with a water dampened soft cloth. After cleaning, dry and allow to remain in a dry environment for 2 hours before use.

6.5 Repair & Service

There are no user serviceable parts in this unit other than those that may be described in section 6. Return to Martindale Electric if faulty. Our service department will quote promptly to repair any fault that occurs outside the guarantee period.

6.6 Storage Conditions

The instrument should be kept in warm dry conditions away from direct sources of heat or sunlight, and in such a manner as to preserve the working life of the unit. It is strongly advised that the unit is not kept in a tool box where other tools may damage it.

7. WARRANTY AND LIMITATION OF LIABILITY

This Martindale product is warranted to be free from defects in material and workmanship under normal use and service. The warranty period is 2 years and begins on the date of receipt by the end user. This warranty extends only to the original buyer or end-user customer, and does not apply to fuses, disposable batteries, test leads or to any product which, in Martindale's opinion, has been misused, altered, neglected, contaminated, or damaged by accident or abnormal conditions of operation, handling or storage.

Martindale authorised resellers shall extend this warranty on new and unused products to end-user customers only but have no authority to extend a greater or different warranty on behalf of Martindale. Martindale's warranty obligation is limited, at Martindale's option, to refund of the purchase price, free of charge repair, or replacement of a defective product which is returned to Martindale within the warranty period.

This warranty is the buyer's sole and exclusive remedy and is in lieu of all other warranties, expressed or implied, including but not limited to any implied warranty of merchantability or fitness for a particular purpose. Martindale shall not be liable for any special, indirect, incidental or consequential damages or losses, including lo and exclusions of this warranty may not apply to every buyer. If any part of any provision of this warranty is held invalid or unenforceable by a court or other decision-maker of competent jurisdiction, such holding will not affect the validity or enforceability of any other provision or other part of that provision.

Nothing in this statement reduces your statutory rights.

Specification
DTL84 Data Logging Thermometer

All specified accuracies are at 23°C ± 5°C < 90% R.H. (non-condensing) for 1 year.

Temperature coefficient:
0.01% of reading + 0.05°C (0.0028°F) per °C (0°C to 18°C, 28°C to 50°C or 32°F to 64°F, 82°F to 122°F)

Range:
K: -200°C-1372°C (-328°F-2501°F)
J: -200°C-1000°C (-328°F-1832°F)
E: -200°C-750°C (-328°F-1382°F)
T: -200°C-400°C (-328°F-752°F)
N: -200°C-1300°C (-328°F-2372°F)
R, S: 0°C-1767°C (32°F-3212°F)

Resolution: K-, J-, E-, T-, N-type
0.1°C < 600°C
0.1°F < 1000°F
1°C ≥ 600°C
1°F ≥ 1000°F

R-, S-type
0.2°C < 600°C
0.5°F < 1000°F
1°C ≥ 600°C
1°F ≥ 1000°F

Accuracy:

J, K, E, T, N-type	
-200°C to -100°C	± (0.5% of reading +0.7°C)
≥100°C	± (0.1% of reading +0.7°C)
-328°F to -148°F	± (0.5% of reading +1.3°F)
≥-148°F	± (0.1% of reading +1.3°F)

R, S-type	
0°C to 1767°C	± (0.2% of reading +1.4°C)
32°F to 3212°F	± (0.2% of reading +2.5°F)

General purpose 100cm Type K thermocouple bead probe
Temperature measurement range: -50°C to 200°C (-58°F to 392°F)
Probe accuracy: ± 2.2°C (± 3.9°F)

Specification
DTL84 Data Logging Thermometer

GENERAL

Display: Liquid crystal display
Over range: OL is displayed
Measurement rate: twice per second
Power: 4 x 1.5V AAA alkaline batteries (IEC LR03, NEDA 24A)
Continuous operating time: Bluetooth OFF – 120 hours approx
                                         Bluetooth ON – 30 hours approx
Auto power off: Setable to 10mins, 30mins, 1hr, 2hrs, 4hrs, 8hrs or disabled
Dimensions: 187mm (L) x 75mm (W) x 29mm (H)
Weight: 290g
Includes: storage case, 2 x K-type thermocouples, bluetooth adaptor, 4 x 1.5V AAA alkaline batteries, DTL84 software CD, micro USB cable and instruction manual.

ENVIRONMENTAL

Temperature & Humidity: Operating: 0°C to 50°C, 10% to 90% R.H. non-condensing
                                          Storage: -20°C to 60%, 10 to 75% R.H.

EMC

Conforms to BS EN 61326-1

Check out what else you can get from Martindale:

- 18th Edition Testers
- Accessories
- Calibration Equipment
- Continuity Testers
- Electricians' Kits
- Environmental Products
- Full Calibration & Repair Service
- Fuse Finders
- Digital Clamp Meters
- Digital Multimeters
- Labels
- Microwave Leakage Detectors

- Motor Maintenance Equipment
- Multifunction Testers
- Non-trip Loop Testers
- Pat Testers & Accessories
- Phase Rotation Testers
- Proving Units
- Socket Testers
- Thermometers & Probes
- Test Leads
- Voltage Indicators
- Specialist Metrohm Testers (4 & 5kV)
- Specialist Drummond Testers

CE