DM650XTM USER GUIDE

ATEX APPROVED BATTERY POWERED DIGITAL THERMOMETER

Important - Please read this document before installing; in particular the ATEX information when applicable to the application.

Every effort has been taken to ensure the accuracy of this document; however, we do not accept responsibility for damage, injury, loss or expense resulting from errors and omissions, and we reserve the right of amendment without notice.

IMPORTANT - CE & SAFETY REQUIREMENTS

The instrument is designed to be battery powered. The user must ensure all sensor and cable entries maintain environmental protection to at least IP65 rating.

The product contains no serviceable parts, or internal adjustments. No attempt must be made to repair this product. Faulty units must be returned to supplier for repair.

This product must be installed by a qualified person. All electrical wiring must be carried out in accordance with the appropriate regulations for the place of installation.

ABSOLUTE MAXIMUM CONDITIONS (To exceed may cause damage to the unit).	
Ambient temperature depending on batteries 1.5 v lithium (ENERGIZER L92)	Temperature (-20 to 60) °C

Important - Please read this document before installing.

1~DESCRIPTION.

The DM650XTM accepts RTD or thermocouple temperature sensors, and displays the sensor temperature in °C, °F, °R or K on a 6-digit LCD display. In addition to this, on board datalogging is also available to record process details at up to 1500 points.

2~RECEIVING AND UNPACKING.

Please inspect the packaging and instrument thoroughly for any signs of transit damage. If the instrument has been damaged, please notify your supplier immediately.

3~SPECIFICATION.

Refer to data sheet for full specification. Download at www.status.co.uk

Factory default	Eu Pt100, Unit °C, DP 0.0, Offset = 0.0, Pass-code =0000 10 s update, Logging = off

4~SPECIAL CONDITIONS for use to comply with CE and safety

1	The equipment must be installed correctly, providing environmental protection of IP 65 or greater. Steps must be taken to ensure the maximum ambient operating range is not exceeded, in particular, the temperature probe surface temperature at the point of entry into the equipment housing.
2	The maximum recommended sensor wire length is 10 metres. To maintain full CE EMC requirements for industrial applications, max length is 3 metres.
3	Apart from battery replacement, the device contains no serviceable parts. No attempt must be made to repair this product. Please return faulty devices to the supplier.
4	This equipment must be installed by a qualified person. All electrical wiring must be carried out in accordance with the appropriate regulations for the place of installation.
5	Primary Cell Batteries – fire, explosion and severe burn hazard. Do not attempt to re-charge, crush, incinerate, disassemble, heat above 50 °C or expose to water. Disposal of the batteries must conform to the regulations applicable to the area of use.
	ATEX Applications. Special Conditions for Safe Use.
6	**Only suitable for connection to Thermocouple or RTD temperature sensors. The sensor will conform to the requirements for simple apparatus as defined in IEC 60079-11 clause 5.7.**
7	**As the display is physically connected to a possible source of heating or cooling (the temperature sensor), the temperature at the point of connection shall be within the ambient temperature range as given in the certificate.**
8	**Sensor connection using multi-strand wires must use a crimp to avoid the possibility of a strand of wire becoming free.**
9	**Batteries (two) – use only type L92 manufacturer Energizer (ultimate Lithium) size AAA, 1.5 V. Temperature range -40 to 60 deg C Approval Baseefa14ATEX0107U. Available worldwide.**
10	**Batteries to be replaced in safe area only.**
11	**Electrostatic hazard – do not charge by rubbing or cleaning with a solvent.**
12	**The unit shall be cleaned regularly to prevent the build-up of excessive dust layers. Avoid rubbing.**

5~ ATEX INSTRUCTIONS.

User instruction for DM650XTM electrical apparatus when used in a hazardous area.

Important: Read and understand this section before any installation.

Refer to Eu Type Examination Certificate
CML 20ATEX2030X

See Specific Conditions of Use (Special Conditions)

Product Information

Zone Area Classification	
Gases	**Dusts**
Zone 0	**Zone 20**

DM650XTM **CML 20ATEX2030X**
Tamb = -20 °C to +60 °C
II 1 GD CE XXXX IECEx CML 20.0013X
Ex ia IIC T4 Ga **Ex ia IIIC T135°C Da**

Working Parameters
Terminals 1,2,3,4
Uo = 3.66 V dc, Io = 17.0 mA, Po = 0.016 W

6~INSTALLATION ⚠

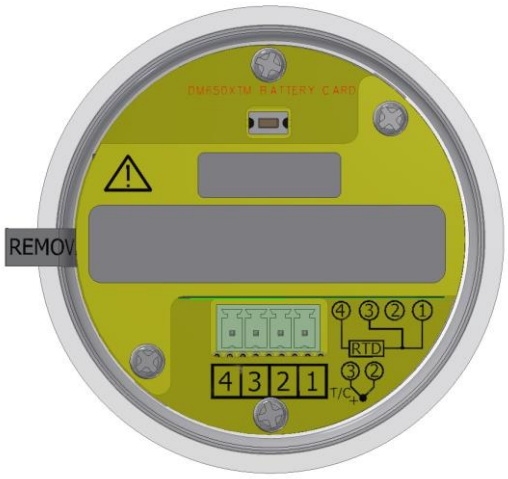


Figure 1: Back panel battery cover fitted

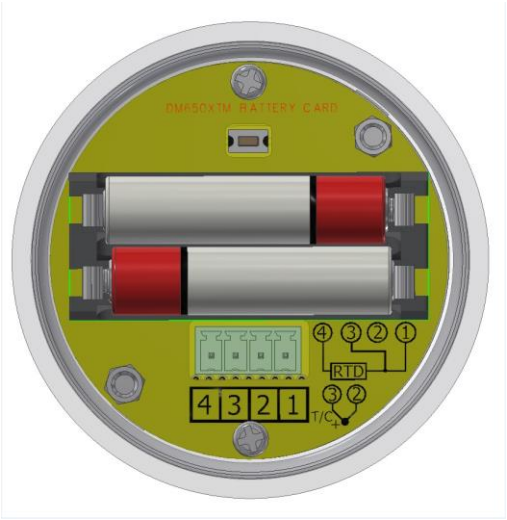


Figure 2: Back panel battery cover removed

6~1 Battery ⚠

ATEX applications use only Energizer L92 batteries, 2 required. Do not use any other type, or mix batteries with any other type. Batteries must be replaced in the safe area. Follow the procedure below. When the cap assembly is removed and disconnected, transport cap assembly to the non-hazardous area. When the batteries are replaced, be sure the battery cover is fitted before returning to the hazardous area. Failure to perform the battery replacement correctly may result in an unsafe system.

Please observe the above battery warnings. Refer to Figure 2 (Observe polarity). Battery type 1.5 V Lithium ENERGIZER L92 AAA size offering longer life at high temperature: must be used for ATEX applications.

To fit or replace batteries, use the following procedure:	
Note: If fitted, the battery isolation tab will need to be removed before use.	
1	Turn the cap retaining ring anti-clockwise until the ring releases from the enclosure body.
2	Remove the cap assembly from the enclosure base, un-plug the 4-way connector. The cap assembly should now be totally free from the base.
3	**For ATEX applications: at this stage, if not already in a safe area, the cap must be transported to a safe area.**
4	Remove the battery cover by unscrewing the two retaining screws. If fitted, remove the batteries to be replaced.
5	Fit new batteries. Observe the polarity symbols marked on the battery holder.
6	Replace the battery cover, ensure the information label is visible. Secure the two retaining screws.
7	**For Atex applications, return the cap assembly to the hazardous area.**
8	Inspect the cap O ring seal for correct alignment. Reconnect the 4-way plug and site the cap assembly back on the case base.
9	Tighten the retaining ring until it stops turning smoothly. At this point, tighten an additional 1/12 of a turn. Use the indents on the retaining ring to gauge 1/12 of a turn as 12 indents are equally spaced around the retaining ring.
Please dispose of batteries in a responsible way	

6~2 Maintenance

The following maintenance is required.:
Battery replacement: the expected battery life in normal operation well exceeds 1 year; the exact life depends on many factors such as the number of log reads, response time and the ambient operating temperature. A low-battery warning is displayed when the batteries' voltage approaches discharge. It is recommended at this time the batteries are replaced within a month.
If required, the device may be cleaned with a damp cloth. For ATEX applications please refer to **"ATEX Applications Special Conditions for Safe Use"** for further information on cleaning.
The device uses advanced circuitry and high stability components to maintain accuracy. For recalibration, the device must be returned to the supplier for factory calibration. A single point offset trim is provided to cancel any sensor error if required.
The device contains no other user-serviceable parts. Please return faulty units to your supplier for factory repair or replacement.

6~3 Sensor wiring

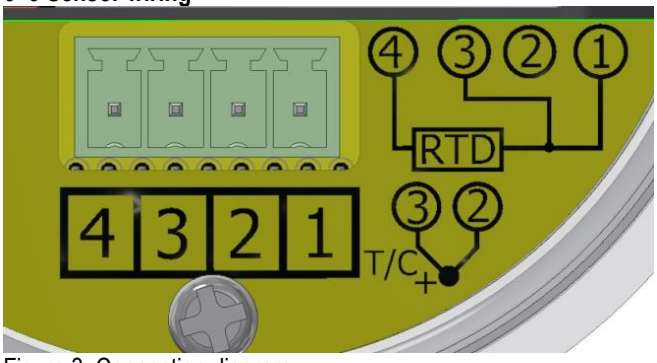


Figure 3: Connection diagram

Important –unplug the 4-way sensor connector from the device during wiring, re-connect when wiring is complete. Ensure the sensor wires are long enough (80 to 100 mm) to allow easy access for reconnecting the plug to the device and, if required, access to the configuration switch.

6~3 Sensor wiring (continued)

General – the instrument is designed to be directly attached to the sensor probe assembly. Remote Probes may be used but the user must ensure all sensor entries maintain environmental protection to at least IP65 rating. To comply with CE EMC requirements the sensor wires should be no longer than 3 metres. When using an RTD, for best results we recommend using three-wire connection; this method compensates for any lead resistance between the sensing element and instrument. Two-wire RTD connection is possible by linking pins 1 and 3: refer to Figure 3.

Thermocouple wire type must be maintained from the sensor element to the instrument terminals. The terminals are effectively the cold junction point and can be displayed as "Tamb" ambient temperature.

7~USER CONFIGURATION.

IMPORTANT

READ COMPLETE SECTION BEFORE ATTEMPTING CONFIGURATION

The device is configured using a single push button and a series of menus displayed on the LCD screen. The push button is internally located and is intended for configuration and commissioning operations only. The device may be supplied pre-configured if requested at the time of purchase. Refer to the configuration section for further details.

7~1 Display information

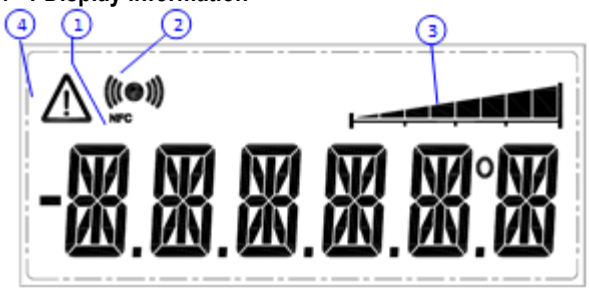


Figure 4: Display layout

1 NFC icon active when NFC field is detected.
2 Comms icon active during communication.
3 Log bar. The log bar will show the percentage of logs taken up to the maximum.
4 Warning Symbol

7~2 Push-button Configuration

A single push-button is provided together with a simple configuration menu for configuration. The following variables can be configured: sensor type, temperature unit, decimal place and offset.

Single press, in display mode to enter the menu lists.

The configuration settings are presented as a series of menu lists. A single press (click) from display mode is used to enter the configuration menu lists.

The order of the menu lists options is as follows:

- Sensor type.
- Display unit.
- Decimal place.
- Response time.
- Offset.
- Pass code.

Long Press > 2 seconds, in configuration mode

To advance through the menu option lists, press continuously for over 2 seconds. This action is used to advance to the next option in the menu list and to confirm a selection, and when a variable has been selected.

Single press and Double press, in configuration mode

A single press (click) from configuration mode. This action steps through the selected menu list variable, e.g. sensor menu list variable = Pt100 Eu, single press will select Pt100 US. A double press steps through the list in reverse order.

No press > 12 seconds, in configuration mode

To escape from the configuration menu, allow a period of 12 seconds with no button action.

Alternatively, stepping through the menu list options will return the device to the run mode.

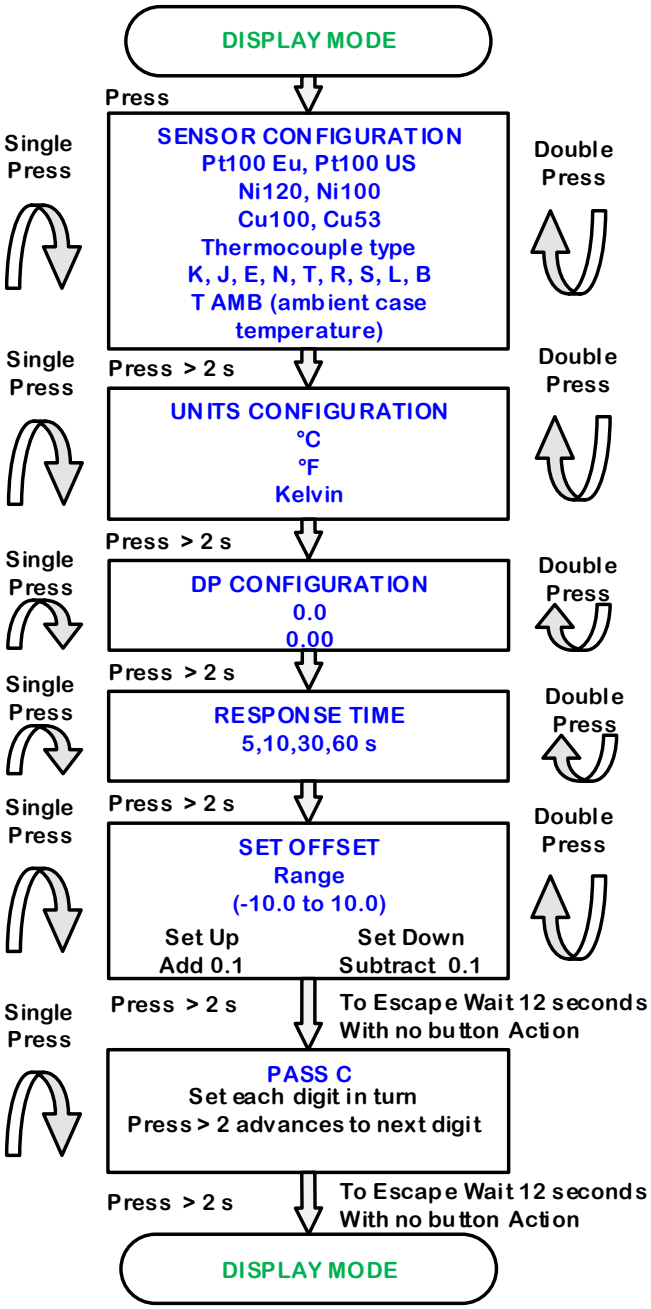


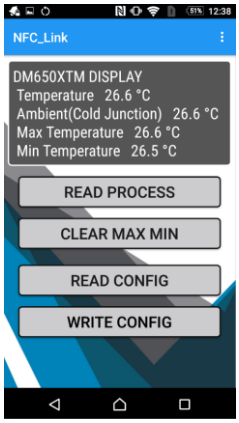
Figure 5: configuration menu flow diagram.

⚠ IMPORTANT
NFC functions are only to be carried out in the safe area or with a suitably approved ATEX NFC device.

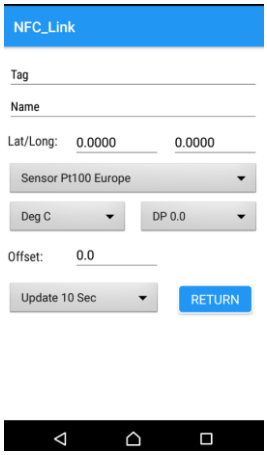
7~3 NFCLink software configuration

The NFC interface allows the instrument to communicate with an Android device using NFC connectivity.
The prime function of the interface is to configure the device using the free app, which is available for downloading to Android devices.
The app allows the user to set the parameters shown in the configuration screen (below).
Tag No and Contact are free type fields, saved onto the device.
Latitude and Longitude can be used to add the unit's location which is added to the log in the NFCLogLink software.

Read process screen showing maximum and minimum values since the last clear command.



Configuration screen

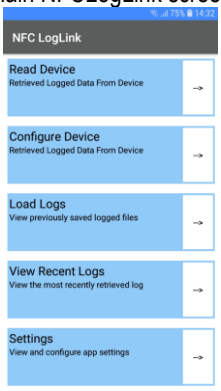


7~4 NFC Loglink configuration software

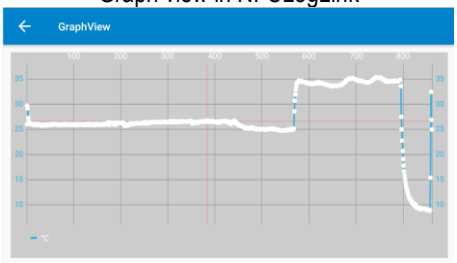
The NFC interface allows the instrument to communicate with an Android device using NFC connectivity.
The prime function of the interface is to read logged data from the device using the free app, which is available for downloading to Android devices.
The app allows the user to read existing logs, change the log manifest, start a new log, synchronise the instrument clock and reset the maximum/minimum readings.
Logs can run to a fixed number and stop or continually roll over. Up to 1500 log points can be recorded. The start of the log can be delayed up to one month.
Data from NFCLogLink can be viewed on screen as a graph or table and can also be saved to a csv file.

Note: For larger logs the data may take over a minute to fully download via the NFC interface.
Note: Not all Android devices fully implement the near field communication (NFC) standard and may not hold the full 1500 log points.

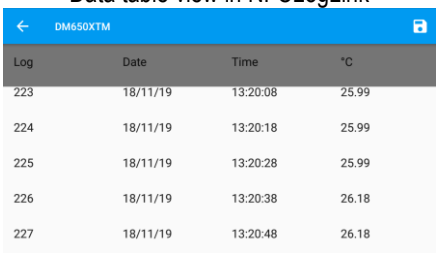
Main NFCLogLink screen



Graph view in NFCLogLink



Data table view in NFCLogLink



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