STATUS INSTRUMENTS

DM650LP USER GUIDE

LOOP POWERED DIGITAL DISPLAY WITH RELAY AND USB/NFC INTERFACE LOGGING FUNCTION. USER GUIDE

Important - Please read this document before installing.
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, UKCA & SAFETY REQUIREMENTS. ⚠

The instrument is designed to be either directly attached to a sensor probe assembly or surface mounted. The user must ensure all sensor and cable entries maintain environmental protection to at least IP65 rating.
Battery - Fire Explosion and Severe Burn Hazard. Do not attempt to re-charge, Crush, Incinerate, Disassemble, Heat above 100 °C (212 °F) or expose to water.
Disposal of the battery must conform with the regulations applicable for the area of use.
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.
Before attempting any electrical connection work, please ensure the battery is removed

ABSOLUTE MAXIMUM CONDITIONS: To exceed may cause damage to the device.	
Battery voltage	3.7 Vdc (Protected for reverse connection)
Input current	± 50 mA
Relay	50 Vdc, 40 Vac rms
Ambient	Temperature (-30 to 70) °C, Humidity (10 to 95) % RH noncondensing)

UKCA CE ♲ ⚠ **Important – Read this document before installing.**

1~DESCRIPTION.

The DM650LP loop powered indicator with battery backup accepts a (4 to 20) mA signal and provides a powerful display interface based on a 6-digit 14-segment LCD display. User-set scaling is provided to allow the user to set process ranges between -999999 and 999999. Maths functions are provided working on the actual (4 to 20) mA signal for requirements such as square root extraction.
A 22-segment user-set linearisation/correction function is offered, as well as advanced messaging, allowing the user to display custom messages for pre-set input ranges.
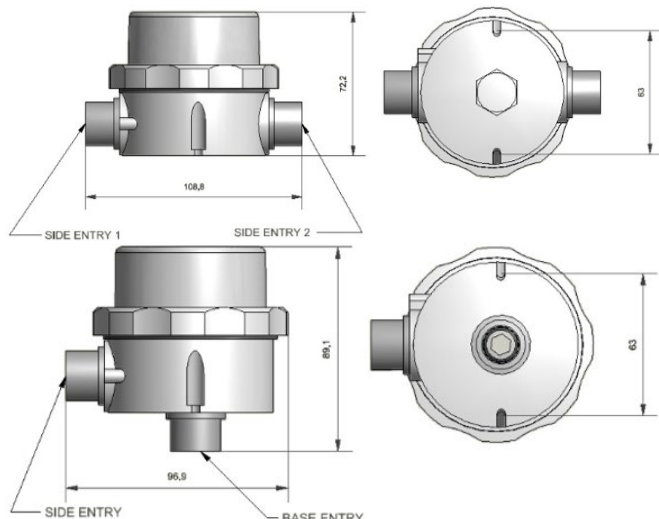
2~RECEIVING AND UNPACKING.

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.

Configuration	
Factory default	(4 to 20) mA = (0 to 100) °C, Relay off

4~ INSTALLATION AND WIRING.

4.1~MECHANICAL.

The instrument is a high accuracy digital (4 to 20) mA loop powered display. In order to ensure correct operation, the following must be observed:
The product must be stored in a dry clean environment and remain in original packaging prior to installation.
The instrument must not be installed adjacent to electro-mechanical starters, controllers, thyristor power units or electrical switch gear.
Any cleaning of the instrument must be done using a mild detergent and soft cloth. No solvents or abrasive cleaners should be used.
Stated ambient operating conditions must not be exceeded. Battery life will reduce with higher ambient temperature operating conditions.

4.2~ELECTRICAL.

For a wiring diagram please refer to the rear panel of the DM650LP inside the case housing and Figure 1.
Screw connectors are used for input and relay connections, allowing the unit to be used with some in head temperature transmitters (refer to sales for details). On insertion of battery the unit will run through a power-up check; during this time the relay may change state.

IMPORTANT: Always remove battery before any wiring takes place. Gain access to the connectors and battery holder by twisting cap to release front panel assembly from case.

INPUT: The SEM650LP is to be wired in series on a (4 to 20) mA loop. The battery is not required for basic display operation, however for datalogging operation the battery will be required. The connections are marked "+" and "-".

RELAY CONNECTION: A relay with changeover contacts is available. Screw terminals are provided for connection for wire size 16 to 20 AWG. The relay contacts are rated at 48 VDC 28 VAC RMS @ 1 A (5 mA minimum current) see DM650LP data sheet.
The relay connections are marked "NO" for normally open, "NC" for normally closed and "C" for common.

BATTERY: To remove battery, use screwdriver to ease the positive end of the battery out of holder. Insert new battery negative end first then press into place. (Observe polarity). Battery type 3.6 V Lithium (2.4 A/Hr) CR14505 (IEC) AA case style. Please dispose of the battery in a responsible way.

WARNING ⚠

For configuring, reading live data or reading logged data if using a grounded loop on the input, it is important not to connect the programming USB lead to a mains-powered computer. It is possible to damage the instrument if connected in this way.
To avoid damage, use one of the following methods:
- Disconnect the loop before configuration, reconnect the loop after configuration.
- Ensure any sensor connected and DM650 housing are not in contact with any conductive parts during configuration.
- Use a laptop-type computer running from its battery power supply, not connected to a mains supply. This is recommended for reading lived data or offsetting a unit if already installed in the field.
- Use a USB isolator between the computer and the DM650.

5~USER CONFIGURATION. ⚠

IMPORTANT READ COMPLETE SECTION BEFORE ATTEMPTING CONFIGURATION.

The instrument is provided with a USB interface for direct connection to a PC. Free software USBSpeedLink is available. Please refer to the USBSpeedLink software for further information on configuration. The software can be downloaded from www.status.co.uk.

DISPLAY: The display provides six 14-segment characters for display of temperature and alpha-numeric messages, together with an 8-segment bar graph and six icons. The display can operate in an ambient temperature range of (-30 to 70) °C, but at temperatures lower than -5 °C (due to the slower LCD speed) scrolled messaging is not practical for screen updates.
The display's high contrast, coupled with a digit height of 7.9 mm, offers clear readouts at low as well as high ambient light and direct sunlight.

The display layout is as follows:
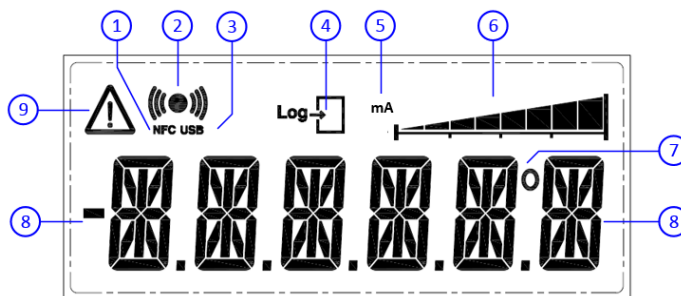
5~USER CONFIGURATION (continued).

1. NFC - The Symbol is on when an NFC field is detected. When a detected field is lost the symbol will turn off after a few seconds.
2. TRANSMIT/RECEIVE: Symbol on when either NFC or USB communication is active.
3. USB: Symbol on when USB port is connected to a PC. Please note battery is not required during configuration.
4. LOG: Not used
5. mA: On when bar graph is set to display % mA input range, off when bar graph shows % log fill.
6. BAR GRAPH: Indicates the state of the logger. The condition is dependent on the selected logger mode, either Single or Rolling mode.

Single Mode (Log to the maximum number of logs then stop)

Start of Log	Mid Log	End of Log (alternating)
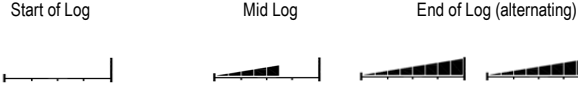
Rolling Mode (Log to the maximum number of logs then as each new log is taken the oldest log is discarded)

Start of Log	Mid Log	Rolled over Log (max bar toggles)

7. DEG: Degree symbol "°" used to indicate either °C, °F, °R or K on the last digit.
8. DIGITS: Six-digit 14-segment display with – sign, range 9999.9 to -9999.9. Advanced mode offers two process value-dependent 32-character message options.
9. WARNING ICON: This symbol will toggle on and off to indicate a warning. The warning symbol will be active either when the sensor signal is out of range or not connected.

MULTI-FUNCTION ALERT LED
The alert LED normal state is off, on alert the LED will emit a intense white light pulse every 5 seconds. The LED can be programmed to pulse on any of the following combined events:

| Mode	Description
No events	The LED never operates, extending battery life. (Factory default setting).
Trip	Alert when relay 1 trip is on.
Process	In advanced mode only the alert LED can be made to alert in any one of eight user-set process value bands. Example, to alert operator when process value is outside a safe operating range. The function of the alert LED can be further enhanced with the option of displaying an alert message in advanced display mode.

NFC LOGGER INTERFACE
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 a 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/average readings. Logs can run to a fixed number and stop or continually roll over; up to 5000 log points can be recorded. The start of the log can be delayed up to one month.
Note: For larger logs the data may take over a minute to fully download via the NFC interface.
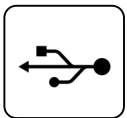
### USB LOGGER INTERFACE (connector inside housing)
The USB interface allows the instrument to communicate with a PC running the USBLogLink software
The prime function of the interface is to read logged data from the device using free software available to download.
The software allows the user to read existing logs, change the log manifest, start a new log, synchronise the instrument clock and reset the maximum/minimum readings.
USBLogLink is available from www.status.co.uk.

USBSLogLink DATA LOGGER SOFTWARE*1 *2
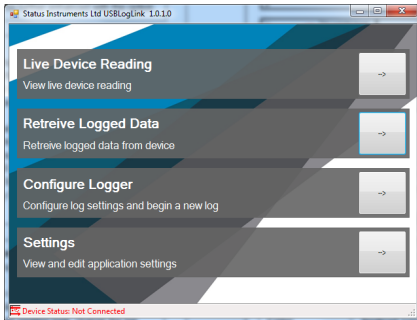
LIVE DEVICE READING TAB	
Display	Live process value
RETRIEVE LOGGED DATA TAB	
Download and graph recorded logged data	
CONFIGURE LOGGER	
Set new log (rolling or fixed), interval time, number of logs, delay start	
Enter (tag and contact), reset (max and min) Sync clock	

USBSpeedLink CONFIGURATION SOFTWARE*1

PROCESS SCALING TAB	
Select	Linear or maths, decimal place, engineering units, display range, user linearisation table, null least significant digit(s) if required.
If display type = Temperature then °C, °F, °R, K units can be selected otherwise the advanced messaging TAB can be used to add an engineering unit.	
Pre-set Sensor Signal to Set-Point the input value can be fixed to a pre-determined value, the messaging display and relay will respond accordingly.	

RELAY OPTIONS TAB	
Select	Select relay operation, set-point, dead band, relay name
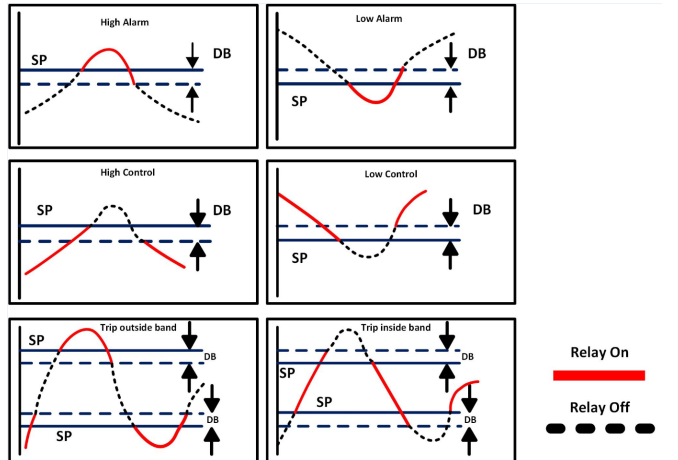
BASIC DISPLAY OPTIONS TAB	
Select	Bar graph function to % of mA input or % of log fill
Select	LED alert for, relay

ADVANCED DISPLAY OPTIONS TAB	
Select	Message bands, custom messages
Use this software tab to set up advanced scrolling user messaging	

OTHER DEVICE OPTIONS TAB	
Enter	Tag, contact details
Enter	Android passkey (protect logged data)
Enter	Device location
Read/clear	Maximum and minimum reading
Synchronise	Clock

*1 Logging and configuration software can be downloaded from www.status.co.uk
*2 NFC ENABLED ANDROID DEVICE REQUIREMENTS Tag Type NFC Forum Tag Type 4 (max capacity 65536 Bytes) RF Interface ISO/IEC 14443 Type B Compliant (13.56 MHz) Android device Compatibility to read NFC Tag type 4 to full capacity 65536 bytes
Note: If the android device cannot read full bytes the maximum number of log points will be reduced.

Figure 1
Typical wiring for a DM650LP connected on a (4 to 20) mA loop.