

DM700/I LOOP-POWERED INDICATOR

Designed, manufactured and supported by :



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1.0 DESCRIPTION

The DM700/I is a loop-powered process indicator with a 4-digit 7-segment red LED display. The DM700/I accepts a 4-20mA input signal and displays the associated process variable.

The instrument configuration settings are selectable via a simple to use menu system, which is navigated by the use of three push-button keys located on the rear of the display. This is described over the page in detail.

The entire assembly is sealed into a cap that fits directly onto the SCH4 series of connecting heads. Please refer to the SCH4 datasheet for further information. ATEX approved versions are available for hazardous area use.

2.0 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.

3.0 SPECIFICATION @ 20 °C

Input	4 to 20 mA
Max input Current	100 mA for 1 minute
Accuracy	± 0.02% of full scale input
Max display range	-1999 to 9999
Stability	Zero 0.002%/°C
	Span 100 ppm/°C
Decimal Point	Programmable
Loop Drop	Less than 4 V @ 20 mA
Display	4 digit 7.6 mm red LED
Connection	Two way screw terminal block
Ambient Temperature	-20 to 75°C (Storage -50 to 85 °C)
ATEX Approval	ATEX II G EEx ia IIC T5 option pending
EMC Approval	Tested to BS EN 61326
Hart Transparent	Yes
Mechanical	Low profile SCH4 head ABS, IP67 rating when used with base unit

4.0 INSTALLATION AND WIRING

- The maximum current rating for this device is 100 mA for 1 minute. Exceeding this value will destroy the device. Fuse protection of the current loop to which this device is connected is highly recommended.
- This unit must only be series connected to a 4 to 20 mA current loop. This device will be destroyed if connected directly across any supply with a current output greater than 100 mA.
- Ensure the instrument is installed with adequate protection against the environment. IP67 rating must be maintained.
- Try to avoid installing the equipment close to sources of extreme temperature and electrical or electromagnetic interference.

4.1 Configuration

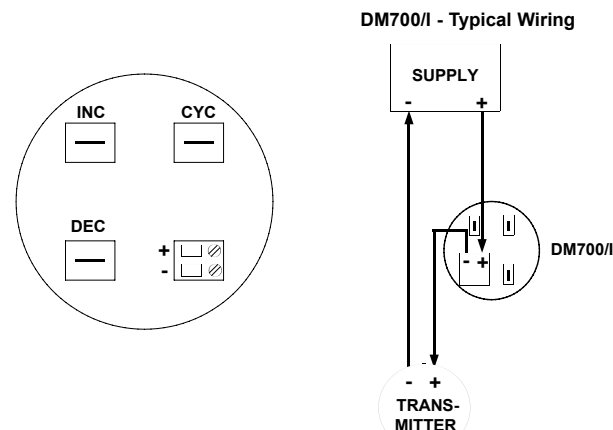
Connect the device to a 4 to 20 mA loop, set at any value between 4 and 20mA. To configure the device follow the simple configuration menus printed on the reverse side of this sheet. Fit the correct units legend to the front panel face.

4.2 Enclosure

The SCH4 case offers various options for sensor/cable entry. Please refer to the SCH4 data sheet for further details.

All external cabling/sensor entries must maintain IP67 rating.

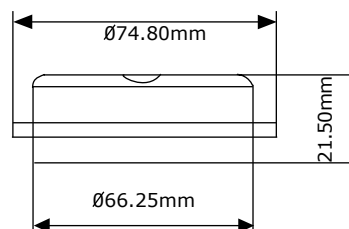
4.3 Wiring and switch location (viewed looking at connector)



5.0 MAINTENANCE

Apart from configuration this equipment requires no user maintenance. If re-calibration is required please contact your supplier for further information. Any cleaning of the instrument should be carried out using a mild detergent and a soft cloth. No solvents or abrasive cleaner should be used.

6.0 MECHANICAL DETAIL



7.0 CONFIGURATION MENU

The prime function of the DM700/I device is to sink a 4-20mA current input and display the associated process variable (PV) in units such as mbar, °C or gallons/minute.

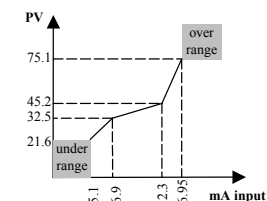
The section overleaf describes the menus accessible on the DM700/I. By accessing these menus, the user can modify the instrument configuration in many ways. The following section refers to the configuration menu to describe how to configure the input scaling.

The instrument needs to know at least 2 co-ordinate pairs to define the relationship between mA input and displayed PV. The default method is to have **SCALE** (scaling) set to **STND** (standard). This allows the user to edit the **ENLO** (engineering low) and **ENHI** (engineering high) PV values that correspond to 4mA and 20mA input values, respectively. The default values for **ENLO** and **ENHI** are 0 & 100, respectively, giving a linear display range of 0-100 for 4-20mA input.

Alternatively, the user may not know the exact PV values at 4&20mA. You can choose **PLTC** scaling to solve this problem. This allows the user to edit **ENLO** and **ENHI** PV values that correspond to LO mA and HI mA input values, respectively. When the user accesses the **SCALE** (scale low) menu entry, the display flashes **PLTC** (input low) to prompt the user to apply the LO mA value. Once the correct input signal is present and stable, the user should press **ENT** to store. The user is then prompted to apply the HI mA value (in **SCH/PHI**).

The user can choose **LIN** (linearisation type) to be **NONE**, **SQR**, **RT32**, **RT52** or **USER**.

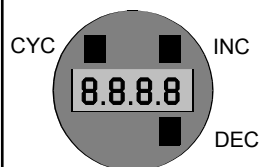
- **NONE** is the default, and sets a straight linear relationship between mA input and PV. The input will go under/over-range at 3.8/21.5mA.
- **SQR** (square root), **RT32** (root 3/2) and **RT52** (root 5/2) set a $X^{1/2}$, $X^{3/2}$, or $X^{5/2}$ relationship, intended for flow applications where, for example, the flow is proportional to the square root of level. The input will go under/over-range at 3.8/21.5mA.
- **USER** allows user-defined linearisation using up to 20 co-ordinate pairs. For example, if the user wanted to apply a 3-segment set of interpolated co-ordinate points as shown below, you would select **LIN = USER**, then set **SEGS = 3**. The user would then set the mA interpolation points as **IN1, IN2, IN3, IN4 = 5.1, 6.9, 12.3, 16.95**. The corresponding PV interpolation points would be set as **OUT1, OUT2, OUT3, OUT4 = 21.6, 32.5, 45.2, 75.1**. The input would then go under/over-range at 5.1/16.95mA.



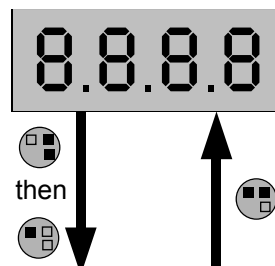
Once the input has been scaled using any of these methods, the user can choose to apply a constant offset to the PV, using the **OFFST** setting. The user can also select the display resolution using the **DECP** setting. A menu access passcode can be set using the **PASS** setting. The menu timeout period can be changed using the **TIME** setting.

7.1 DM700/I CONFIGURATION MENU GUIDE

There are three buttons, which the operator must press in various combinations in order to configure the device. These buttons are located on the underside of the indicator's circuit board. Viewed from the front, the three buttons (CYCLE, INCREMENT and DECREMENT) are shown in black and located as shown in the diagram to the left. Pressing 2 buttons simultaneously causes ENTER or ESCAPE actions.



Run-Time



If no buttons are pressed for a minute or more, the device assumes run-time mode. The display shows the PV (if the input is in range) or shows or to indicate over/under range. In order to access menu configuration mode, the user must press ENTER followed immediately by CYCLE. In order to exit the menu and return to run-time, a user must press ESCAPE.

When cycling around menu, the title (e.g. LIN, SCAL etc.) is displayed for a second, then the menu entry is displayed ready for editing.

CYCLE around menu

- INCREMENT menu entry
- DECREMENT menu entry
- ENTER to confirm entry, or:
- CYCLE to next menu entry

LIN	SCAL	ENLO	ENHI	SLO	SHI	SEGS	IN1	OUT1	IN2	OUT2	etc. up to 20 pairs	OFST	DECP	PASS	TOUR
<p>Choose linear, $X^{1/2}$, $X^{3/2}$, $X^{5/2}$ or user linearisation</p>	<p>Choose Stnd (standard, where electrical hi/lo values are 4/20mA) or AUTO (where electrical hi/lo scaling is given by SLO & SHI)</p>	<p>Low/high values for PV scaling</p> <p><i>Only shown if USER linearisation type is NOT selected</i></p>	<p>Apply low/high scale electrical input, i.e. the electrical low/high values which correspond to the ENLO / ENHI values entered</p> <p><i>Only shown if AUTO scaling selected</i></p>		<p>etc. ...</p> <p><i>Only shown if USER linearisation type selected</i></p>	<p>Choose number of interpolated segments (SEGS) for user-linearisation. Then enter co-ordinate pair values which are to be interpolated. INX values correspond to the electrical input. OUTX values correspond to the displayed PV.</p>						<p>The PV is offset by the number entered here.</p>	<p>Choose the position of the decimal point in run-time</p>	<p>If non-zero, the user will be prompted for this number in order to enter the menu from run-time.</p>	<p>The device will return to run-time after this time</p>

See the application note (available from www.status.co.uk) for more details regarding resetting to factory default and bypassing a forgotten menu passcode. PTO for details for device specification, wiring connections and other important information.