Touch-Pad

Intech INSTRUMENTS LTD

LPI-LCD-5

4-20mA Loop Powered Meter
5 Digit with 0.5" LCD
in a 1/8 DIN Ultra Short Depth Case

CE

World's first 50,000 count, loop powered meter is incredibly easy to scale, from the front panel, to any desired engineering unit of measurement.

General Features

The LPI-LCD is the ultimate advancement in ease of use from the company that developed the worlds first 4-20 mA loop powered meters.

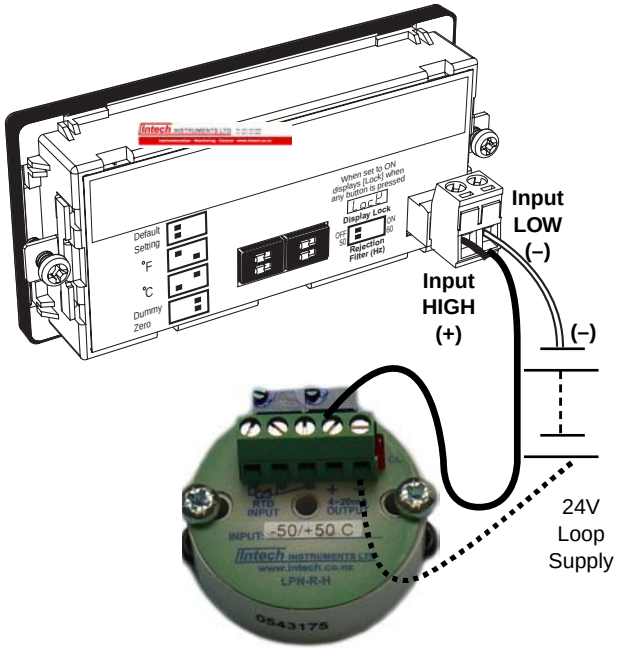
The LPI-LCD features lockable front panel scaling and calibration. Any 4 to 20 mA signal can be scaled from almost any two input values to display any required engineering unit of measure. A 4-20 mA input can display 50,000 counts of resolution from -19,999 to +30,000. The 6th digit can be selected to display °F, °C or an inactive extra zero from a dip switch at the rear of the case.

With less than a 4 V loop drop, this meter can be inserted in most 4~20mA loops.

Two LPI-LCD meters can be mounted in a 96x96 DIN cutout and powered from the same loop, but display different scale readings such as °F and °C, Kgs, M3/Hr, pH etc.

Easy scaling and high resolution also enables the LPI-LCD to be used as a precision counting scale, for nuts and bolts, barrels or boxes.

Typical Application Connections



Compatibility

The LPI-LCD has a matching DIN case style and panel appearance that is complementary to the Lynx, Leopard and Tiger family of meters, except the depth behind the panel is only 15 mm (0.59"). The LPI-LCD makes an ideal extra or remote display as it can operate either in conjunction with the 4-20 mA loop input or operate from the 4-20 mA analog output of most Leopard or Tiger meters.

Specifications

Input Configuration: .....Series connection to 4-20 mA DC current loop. 3.4 volts drop, plus 20 Ω (equivalent to 3.9 V @ 20 mA)

Full Scale Ranges: .....Standard meter is adjustable to any Display Span between a max negative reading of -19,999 and a max positive reading of 30,000, max resolution (50,000 counts), from any signal input span between 3.5 mA and 27.5 mA.

A/D Converter: .....16 Bit Sigma Delta

Accuracy: .....±0.02% of reading plus 2 digits

Temperature Coefficient: Typically 30 ppm/ °C plus 0.1 counts/ °C for zero offset.

Warm Up Time:.....One minute to specified accuracy

Conversion Rate: .....3 readings per second

Display:.....Liquid Crystal Display (LCD) 0.5"

Polarity: .....Assumed positive, displays – negative

Descriptors:.....Dip switch selectable dummy zero, °C, °F

Decimal Point:.....User programmable to six positions

Positive Over-range:.....Display shows – – – – – –

Negative Over-range: .....Display shows _ _ _ _ _ _

Power Supply:.....Designed to be powered from the 4-20 mA current loop input signal. Min input 3.5 mA, Max continuous input 100 mA. 3.4 volts drop, plus 20 Ω (equivalent to 3.9 V @ 20 mA). Typically load is 200 Ω.

Operating Temperature: ..-10°C to +50°C

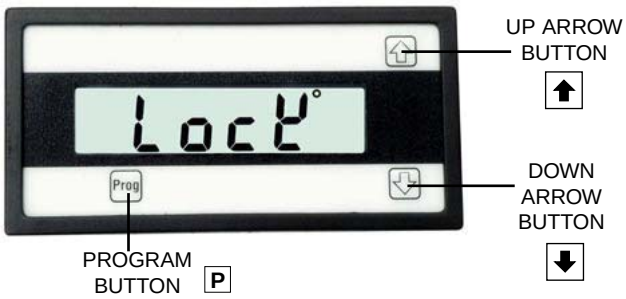
Storage Temperature:.....-20˚C to +70˚C

Relative Humidity: .....95% (non-condensing)

Case Dimensions: .....1/8 DIN, Bezel: 96x48 mm (3.78"x1.89") Depth behind bezel 15 mm (0.59") plus 16.4 mm (0.65") for right-angled Connector

Weight:.....56.7 gms (2 oz)
141.7 gms (5 oz) when packed

Controls and Indicators



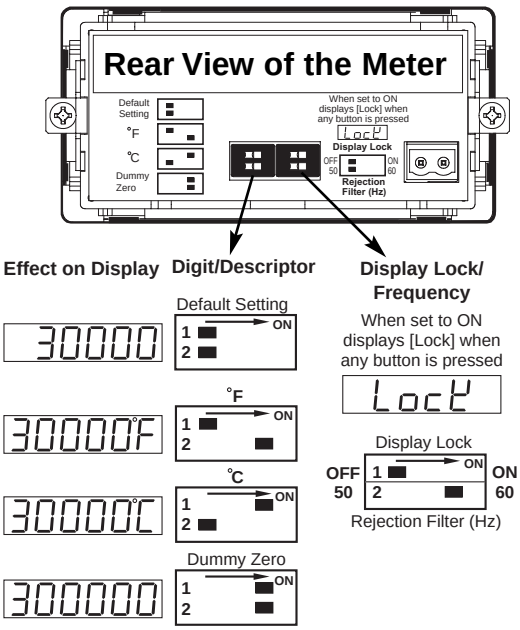
PROGRAM BUTTON: This button is used to move from one program step to the next. When pressed simultaneously with the UP ARROW button, the Programming Mode is entered.

UP ARROW BUTTON: Increases the value of the displayed parameter.

DOWN ARROW BUTTON: Decreases the value of the displayed parameter.

NOTE: When the display lock switch is on and any button is pressed, the display will show only [Lock] momentarily as shown above and then return to the normal operational display.

Dip Switch Settings



Two Point Digital Scaling and Calibration - *Quick Reference Guide*

Two Point Calibration and Scaling

Example: 4 to 20 mA input to read 0 to 20,000

Step 1

Set DIP switch to lock OFF

Operational Display

Press at same time

Enter the Calibration Mode

Step 2

Select [cAL on]

OR

Step 3

Enter the LOW Input [Lo in] Mode

Press 1

Maximum positive reading is 30,000 & maximum negative reading is -19,999. Maximum display span is 50,000 counts.

Step 4

Adjust display to desired reading for LOW input

OR

Any value between -19,999 and 30,000 may be selected. Reverse scaling is accepted.

Step 5

Apply the 4 mA LOW input calibration signal to the meter.

Press 1

Set the LOW input value and enter the HIGH Input [hi in] Mode

If the input signal is disconnected after Step 5, the [Lo in] values are saved, and the meter automatically returns to the [hi in] mode when signal power is re-applied.

Step 6

Max difference between [hi in] & [Lo in] display values selected cannot exceed 32,000 counts.

Adjust display to the desired reading for HIGH input

OR

Step 7

Apply the 20 mA HIGH input calibration signal to the meter.

Press 1

Set the HIGH input value and return to Operational Display

Operational Display

Set DIP Switch to Lock On

If display shows [cALErr] the calibration has been canceled and the previously calibrated scale factors are retained in memory. (See page 2, para 5)

Decimal Point Setting

Step 1

Set DIP switch to lock OFF

Operational Display

Press at same time

Enter the Calibration Mode

Step 2

Press 1

Pass Calibration Mode and enter Decimal Point Setting Mode

Step 3

Adjust the decimal point to the desired position

OR

Step 4

Press 1

Set the decimal point position and return to Operational Display

Operational Display

Set DIP switch to lock ON

Two Point Digital Scaling and Calibration - Detailed Parameters and Notes

The LPI-LCD is incredibly easy to use, and almost any engineering unit or desired display scale can be obtained from almost any input signal value within the following parameters.

Min/Max Input Signal Range and Compliance Voltage

The operational signal range of the meter is 4 to 20 mA. The minimum acceptable input signal is 3.5 mA. The maximum acceptable input signal is 27.5 mA.

The signal must have a compliance voltage of at least 4 V (200 Ω load). For scaling and calibration the input signal should be capable of adjustment between two output values for which the required display value is precisely known.

Scaling can be accomplished with as little as 0.1 mA difference between high and low input signals. However, full scale accuracy is easier to achieve when there is at least a 4 mA difference between the high and low calibration points of the input signal.

Maximum Display Readings

The maximum positive reading that can be displayed is +30000. The maximum negative reading is -19999. Therefore, the maximum viewable digital display span is 50000 counts. Any combination of input signal and scaling that causes the digital display span to exceed these limits produces a display of – – – – – – for over-range or _ _ _ _ _ _ for under-range.

Maximum Range of Input Values for Calibration

For calibration or scaling, the [Lo in] calibration mode is accessed first and the low input signal is applied first. Because reverse scalings are accepted, any display value between -19999 and +30000 may be entered. Likewise, when the [hi in] mode is accessed and the high signal is applied any desired display value between -19999 and +30000 may also be entered. However, the maximum difference between the two display values entered cannot exceed 32000 counts.

Calibration Error Display [cALErr]

If, after entering the calibration values, the difference between the high and low input signal is insufficient (less than 0.1 mA), or if the difference between the two display values exceeds 32000 counts, the meter displays [cALErr]. The calibration values entered are cancelled and the previously calibrated scale factor is retained in memory.

Loss of Input Signal Power During Calibration

If the input signal is disconnected, after the LOW input signal has been applied and the PROGRAM button pressed, the [Lo in] value will be retained. After the signal power is re-applied, the meter automatically returns to the calibration [hi in] mode. The HIGH input signal can then be applied and the [hi in] value entered. This feature is particularly useful when the available calibration signal cannot be adjusted between two known values without discontinuity.

Spans From 32000 Up to the Max 50000 Counts of Display Require Proportional Scaling

There is a 32000 count maximum difference permitted between the [Lo in] and [hi in] display values that can be selected during calibration. In order to achieve display resolutions between 32000 and 50000 counts, it is necessary to scale and calibrate the meter at a lower input signal span than the span at which the meter is intended to be operated.

For Example:

An input of 4 to 20 mA is required to read -19999 to + 30000. Signal Span = 16 mA and Display Span = 50000 counts.

To calibrate the meter in this example with a [Lo in] signal of 4 mA and a [hi in] signal of 20 mA, the difference between the low and high values required would be 50000 counts. This exceeds the 32000 count maximum difference by 18000 counts. Therefore, a lower input signal span should be used.

Proportional Scaling at 50% of Full Scale (High Side)

In the example, a signal change from 12 mA to 20 mA (8 mA = 50% of signal span) produces a display change from 5000 to 30000 (a 25000 count change). With a [Lo in] signal of 12 mA, the display value could be set to 5000, and with a [hi in] signal of 20 mA, the display value could be set to 30000. Result: a signal of 4 to 20 mA would read -19999 to +30000.

Proportional Scaling at 50% of Full Scale (Low Side)

Conversely, in the above example, a signal change from 4 mA to 12 mA (8 mA = 50% of signal span), would produce a display change from -19999 to +5000 (which is also a 25000 count change). Accordingly, the same scaling/calibration result could be achieved while remaining within the 32000 count maximum. With a [Lo in] signal of 4 mA the display value could be set to -19999, and with a [hi in] signal of 12 mA the display value could be set to +5000. Result: the meter will then also be calibrated so that an input of 4 to 20 mA will display -19999 to +30000.

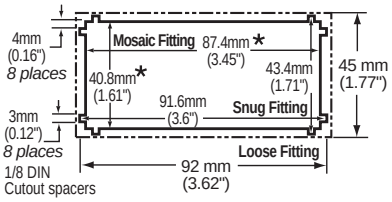
Proportional Scaling at 25% of Full Scale

Similarly, a signal change from 4 mA to 8 mA (4 mA = 25% of signal span) would produce a display change from -19999 to -7500 (a 12500 count change is 25% of 50000). With a [Lo in] signal of 4 mA the display value could be set to -19999, and with a [hi in] signal of 8 mA the display value could be set to -7500. Result: the same scaling is also achieved, and an input of 4 to 20 mA will display -19000 to +30000.

SD Case Dimensions and Panel Cutouts

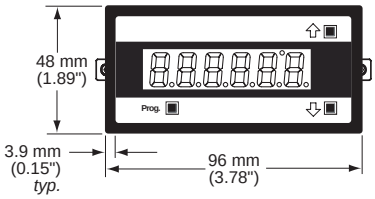
PANEL CUTOUT

Case will mount in standard 1/8 DIN cutouts

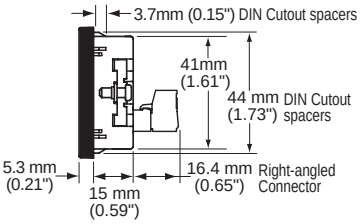


FRONT VIEW

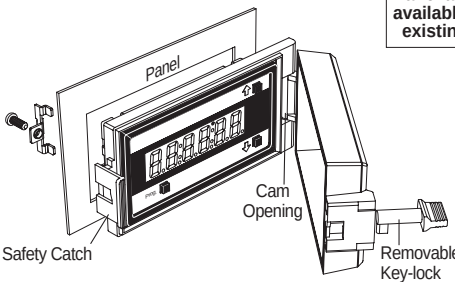
1/8 DIN 96x48mm



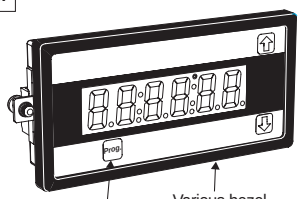
SIDE VIEW



Panel adaptor plates are available to retrofit most existing panel cutouts.

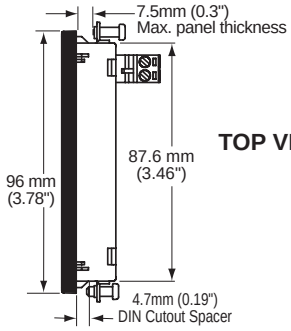


Clear Lockable NEMA 4X Splash Proof Cover



Touch Pad or
Push Button
Faceplate options

Various bezel
colors are available.
Black is standard.



TOP VIEW

The clear lockable cover is designed to be dust and water proof to NEMA-4X, IP65 standards. The assembly consists of a base and cover with a cam hinge and key-lock fastening mechanism. An O-ring, or neoprene gasket forms a seal between the base and the panel. The cam hinge prevents the cover from closing when opened until pushed closed. The cover has a tapered recess that, when closed, forms a seal with a tapered spigot on the base. A key-lock employs a cam locking device to force the spigot into the recess, ensuring seal integrity. A safety catch keeps the cover closed even when the key is removed, and the keyhole can be used to attach a safety seal clip, preventing unauthorized opening.