LM1000 in NEMA 4X Enclosure

WILKERSON INSTRUMENT CO., INC.
www.wici.com

LM1000
Level Monitor and Control

- Available in panel mount and NEMA 4X enclosed versions.
- Bright 4 digit LED Display indicates level in feet to two decimal places
- Built in level sensor calibrator
- Relay output that can be used for alarm or control output.
- Setpoint adjustable over entire 4-20 mA span
- Dead band adjustable 1% to 90%
- Built in 24 VDC 2 wire sensor transmitter power supply
- UL /cUL Recognized

A Single Instrument to Monitor, Indicate, and Control Level and Calibrate Level Transmitters

Replaces Maintenance Demanding Bubbler Systems

The LM1000 is designed to monitor the level of liquids using a pressure sensor as the source of level data. A four digit LED display indicates level in feet to two decimal places (XX.XX). The LM1000 provides 24 VDC regulated power for a 2 wire transmitter.

An Alarm circuit with a SPDT relay output can be set as a high or low alarm. It can be configured as a Normal or Reverse Acting (fail safe) alarm. The Setpoint control is adjustable over the entire 4-20 mA input range and a Deadband control allows the Hysteresis to be set from less than 1% to 90% of the span.

Using the Alarm circuit, the LM1000 can also be used as a level control by setting the Alarm to trip at a high level to start the pump and setting the Deadband to stop the pump when the level falls to the desired lower limit.

The LED display can be switched to indicate level or to accurately indicate the loop 4-20 mA current. A built in calibrator allows the loop current to be adjusted over the 4-20 mA range with a ten turn potentiometer. The calibrator function is chosen with a spring loaded switch that returns the LM1000 to the Level indication mode when released. This spring loaded switch insures the unit is not inadvertently left in the Calibration mode. The unique positioning of the switch in relationship to the adjustment potentiometer allows single handed simultaneous operation of both the switch and the potentiometer.

The calibration function can be used to calibrate the LED display in Level. It can also be used to calibrate the alarm Setpoint and Deadband. An LED indicator behind the display lens indicates when the alarm is energized.

Available options include the LS1000 pressure transducer / transmitter level sensor and a pipe mounting kit for the NEMA 4X enclosure.

Power:	120 VAC ±10%, 50/60 Hz
Input:	2 wire transmitter, output proportional to level (LM1000 provides 24 VDC power to transmitter)
Output:	4 - 20 mADC proportional to Level
Alarm / Control Output:	SPDT Relay rated 5 Amps, 240 VAC
Output Deadband:	Adjustable 1% to 90% of scale
Display:	4 Digit .56" LED
Display Resolution:	2 decimal places to 99.99 Ft. or loop current in mADC
Control Type:	On - Off , Reverse (pump out) or Direct (pump in)
Power Consumption:	3.5 VA maximum
Accuracy:	0.05% of Span ± 1 digit
Operating Temperature:	-13°F to 176°F (-25°C to 80°C)

LM1000 Panel Mount

Enclosures:

Panel Mount (PM)-	Anodized aluminum front panel Dimensions: 6.13" x 7.75" x 1.88"
NEMA 4X (N4) -	Fiberglass reinforced polyester NEMA 4X enclosure, hinged door with viewing window, SS latch with padlock hasp. Dimensions: 9.59"H x 7.71"W x 4.03"D
Custom (CU) -	Per customer specification

LM1000 - N4 - 0 / 32.00 - 120 - 00

Base Part Number

Style:
NEMA 4X Enclosure - **N4**
Panel Mount - **PM**
Custom Panel - **CU**

Power (VAC): **120**
240

Scale: (**0** / **XX.XX** FT)
NOTE: Zero = 4 mA In
Span = 20 mA In

Options (to be added as available):

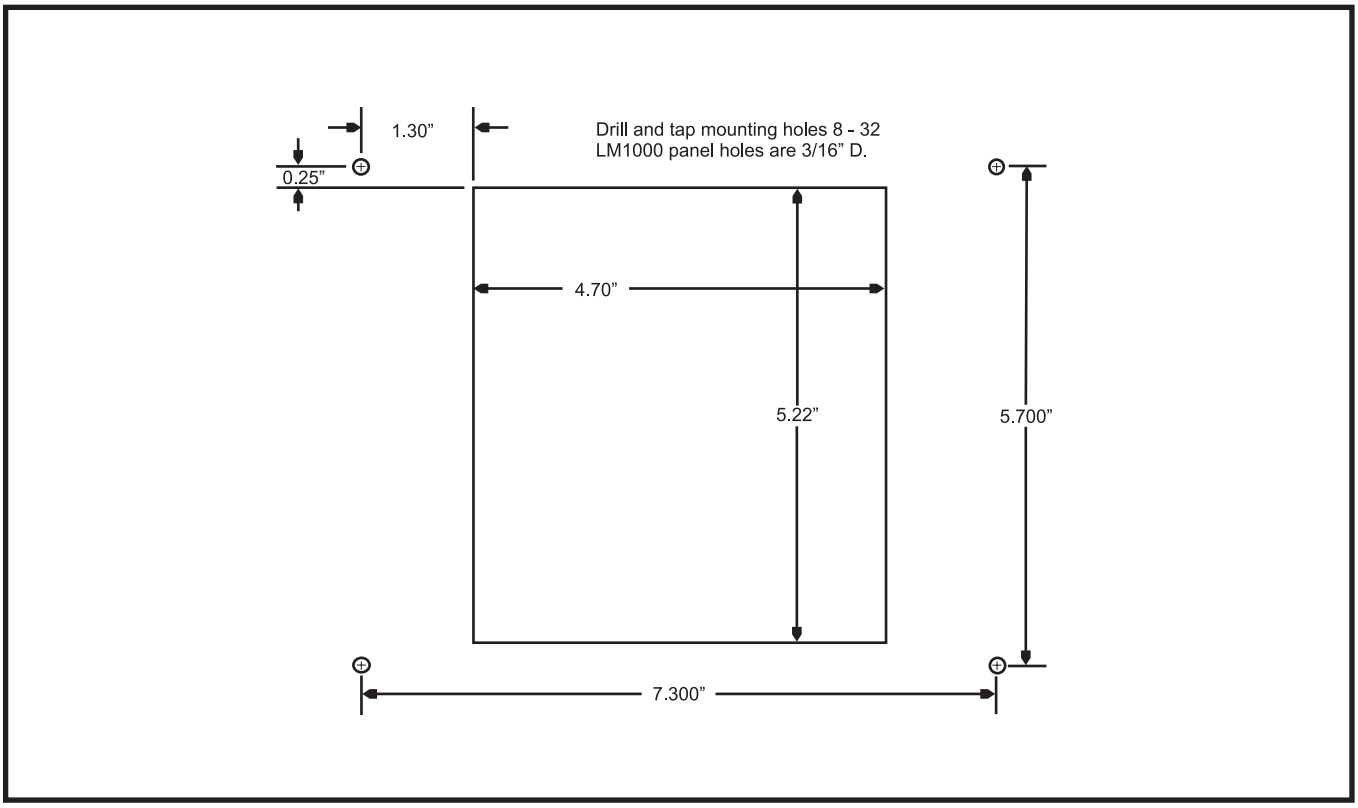
00 = No Options
PMK = Pipe Mounting Kit for N4 Enclosure

NOTE: For submersible level sensor, see Part Number LS1000

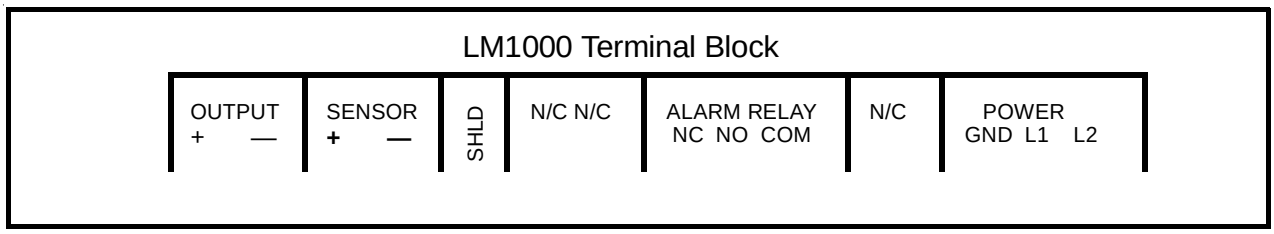
Visit our website at www.wici.com for complete product specifications, engineering documents and downloadable pdf files of product catalog sheets and installation and operation manuals

INSTALLATION INSTRUCTIONS:

Mounting - Mounting and cut-out dimensions for the LM1000-PM are shown below.



Wiring- Connections to the LM1000-PM are made to a 14 pin plug-in screw terminal connector on the rear of the panel. The connector can be wired into a system without the LM1000 being present.



Terminal Marking	Description
Output +	4-20 mA + output representing Level or Calibrator
Output -	4-20 mA -
Sensor +	Two wire transmitter power +
Sensor -	Two wire transmitter -
Shld	Shield (LM1000 circuit common)
N/C	No Connection—can be used to jumper or parallel other wiring
N/C	No Connection—can be used to jumper or parallel other wiring
Alarm Relay NC	Normally closed contact with no power applied to LM1000
Alarm Relay NO	Normally open contact with no power applied to LM 1000
Alarm Relay COM	Relay common contact (wiper)
N/C	No Connection—can be used to jumper or parallel other wiring
Power Gnd	Connection to LM1000 metal chassis and front panel
Power L1	AC Power Line 1
Power L2	AC Power Line 2

The LM1000-N4 NEMA 4X Enclosure model has the terminal block mounted to the enclosure back plate. The user terminates wiring on the terminal block. A short cable is provided that extends from the back plate to the plug-in connector on the rear of the LM1000 circuit board. The electronics may be unplugged from this short cable and the connector on the back plate may be wired without the LM1000 electronics being present.

Terminations are the same as listed above.

LM1000 Level Monitor

Wilkerson Instrument Company, Inc.

CALIBRATION INSTRUCTIONS

Level - If a Wilkerson Instrument Company, Inc. pressure based level sensor (LS1000 series) is ordered with the LM1000, the LM1000 is factory calibrated to display level based on 0.4335 lb/12 in. depth. Example: A 0/15 psi pressure sensor will indicate 0/34.60 ft. for a 4/20 mA input.

Calibration may be verified utilizing the built in calibrator in the LM1000. To verify, switch the display to indicate current. Push the calibrator switch to the Calibrate position and hold. Turn the Calibrator knob to set 4.00 mA on the display. Switch the display to indicate Level. It should indicate 0.00 ft. Repeat this process for 20.00 mA and verify the display indicates the specified level.

If adjustment is required, remove the small cover plate on the display bezel to access all calibration controls. The display level adjustments are identified as “Transmitter Z(ero) and S(pan)”. Set the calibrator current to 4.00 mA and adjust the Z control for 0.00 ft. Set the calibrator for 20.00 mA and adjust the S control for full scale feet based on the level represented by 20.00 mA. Repeat these steps until zero and full scale level display accurately.

Math	For water, the constant 0.4335 psi / ft is used. Full scale display is found by: Level = Full Scale Pressure / 0.4335 Example for 15 psi F.S.: Level = 15 / 0.4335 = 34.6 ft

ALARMS:

High Alarm - The alarm can be set for Normal or Reverse Acting logic. “Normal” is defined as “The relay is de-energized in the non-alarm state”. “Reverse” acting is defined as “The relay is energized in the non-alarm state”. This state is also called “Fail Safe” because the loss of power to the relay causes the contacts that represent an alarm to close.

The relay contact terminology on the terminal block is correct for “Normal” relay logic. It is reversed for “Reverse” relay logic and must be wired accordingly (The NO contact will be closed and will open for an alarm condition).

Low Alarm - In the “Reverse” mode, the alarm becomes a normal acting Low Alarm. If the Level signal is higher than the Setpoint, the relay is de-energized. When the level signal goes lower than the Setpoint, the relay energizes (Normal Acting).

In the “Normal” mode, the Alarm becomes a reverse acting Low Alarm. If the level signal is higher than the Setpoint, the relay is energized. When the level signal goes lower than the Setpoint, the relay de-energizes (Reverse Acting).

Setpoint and Deadband Adjustments - The alarm adjustments are identified as “AL1 SP and DB” (Setpoint and Deadband respectively). Select “NORM” or “REV” logic with the slide switch by the wiring connector on the rear of the unit.

If minimum or a small deadband is desired, turn the DB adjustment fully CCW (25 turns or until you feel the change in torque required to turn when the end is reached).

Set the Calibrator so the display indicates the center of the level limits desired. Turn the SP adjustment until the relay just changes state. An LED behind the display lens illuminates when the relay is energized.

Move the Calibrator adjustment back and forth to determine the exact trip and reset levels of the relay. Adjust the SP and DB controls until the desired trip and reset levels are obtained.

Warranty- The LM1000 carries a limited 3 year warranty against material defects or workmanship. During the warranty period the company will repair or replace any unit, at its option, free of charge in the event of a warranty failure.

WILKERSON INSTRUMENT CO., INC.
www.wici.com

2915 Parkway St. · Lakeland, FL 33811 · USA

Toll Free: 800-234-1343

http://www.wici.com

Tel: 863-647-2000
Fax: 863-644-5318