

KING-GAGE®

Multiple Tank Level Indicator

Tank Liquid Level

Inventory Monitoring

Process Integration

LP2 SP™

- Provides 24 Vdc Transmitter Excitation
- Dual Serial Communications Ports
- 8 Tank Multiple Input Capacity
- Operator Interface Keypad
- Digital Setpoint SPDT Relays



LP2™ SP Multiple Tank Indicator
with Setpoint Status Display

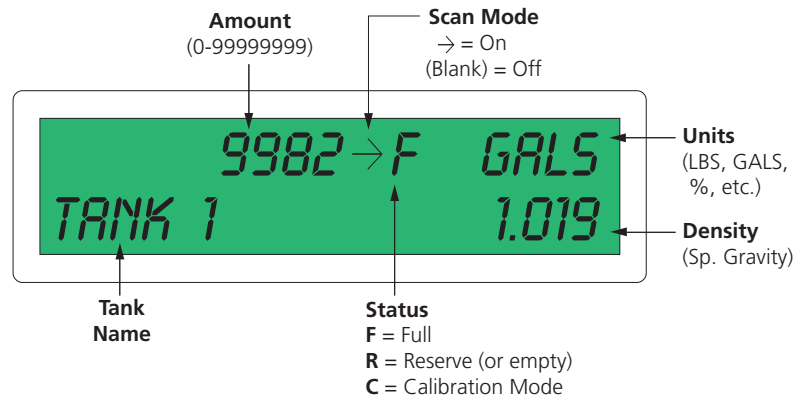
The new **LP2 SP** indicator provides continuous measurement of liquid inventory in storage or processing tanks. Calculating level on the basis of hydrostatic pressure created by liquid depth, the system measures total product mass for more precise material accounting.

A full numeric keypad and function keys support various user selections, including direct entry of control setpoints (high or low level) for each tank. The two line alphanumeric LCD readout shows tank level, readout unit (user selective), tank name and specific gravity in the normal display mode.

Digital Setpoint Control

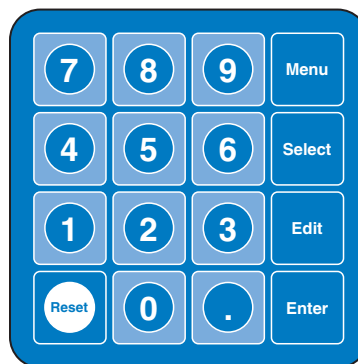
The added functionality of digital set point control offers a complete level monitoring and simplified process control solution for the user. Setpoints are easily entered as volume, weight or percent full values for consistent and accurate process triggers such as pump control or other on/off functions.

LP2 SP includes a display panel to visually confirm setpoint actuations for each tank. Personnel can easily monitor level setpoint status of any or all tanks in the system at a glance.



LP2 SP Operator Interface

You can view tank input channels either by scanning or random access. Press the desired channel number directly to view tank level. To continue viewing tank channels in sequential order, simply press SELECT to view the next channel. Holding the key down for 3-seconds initiates the auto scan mode for all tank channels. Press any key to restore normal single channel display mode.

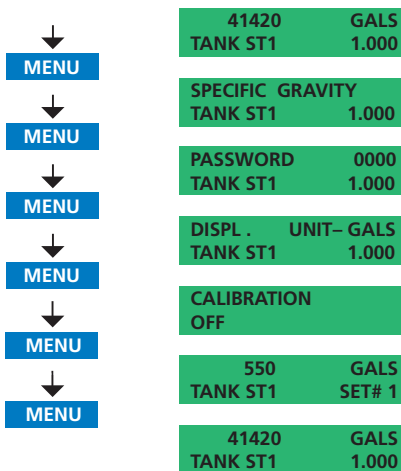


and following the menu selections until SET# 1 or SET# 2 appears. Press the EDIT key and directly enter the level value for the setpoint. This value is stored in nonvolatile memory and will be automatically compensated for any later changes in specific gravity.

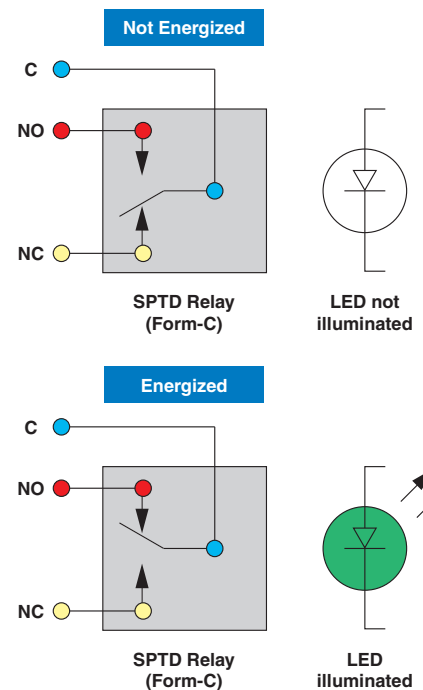
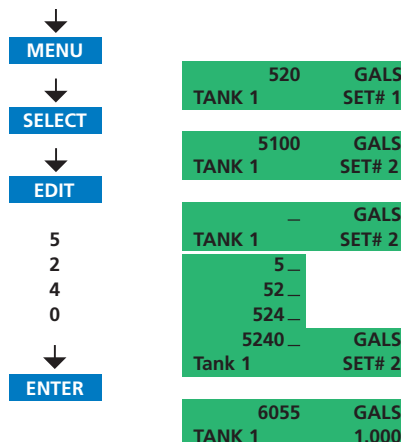
The user interface of the LP2 is extremely easy to operate. Simply press the MENU key to cycle through options such as Display Unit selection, Specific Gravity input, Calibration mode, Setpoints input and Password Access (to restrict specific gravity entry). Entering setpoints is as simple as choosing the tank channel

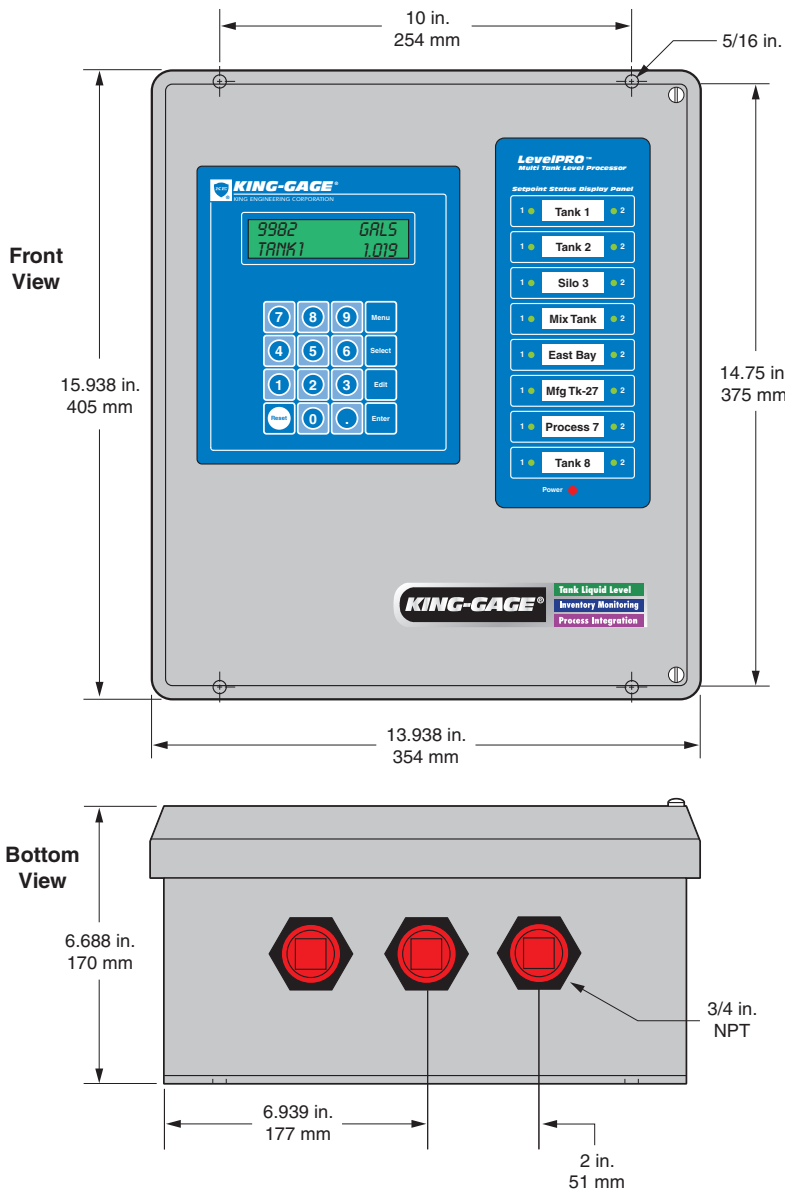
The LP2 SP provides the user with two (2) fully independent SPDT relays per tank input channel. The configuration includes normally-open (NO), normally-closed (NC) and common (C) relay contacts. Factory programming options include standard LOW-HIGH (descending/ascending) or HIGH-HIGH (ascending/ascending) setpoint actuation.

Menu Display Modes



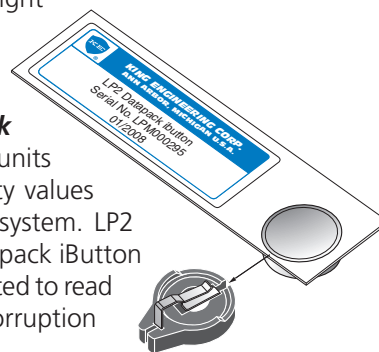
Tank Setpoint Editing





Application Programming

The LP2 indicator references a capacity profile to correlate transmitter output to actual tank geometry. The indicator then formats the resulting value directly as the total weight or volume of liquid in the tank. This profile plus additional application details are factory programmed into an innovative nonvolatile **Datapak iButton*** memory module. Different units of measurement and/or specific gravity values can be assigned to each tank in the system. LP2 stores all the user selections in its Datapak iButton memory. The more critical data is restricted to read only access to prevent any possible corruption of the original factory programming.



Specifications

Power Requirements

100-240 Vac, 50-60 Hz, 25 watts (fused internally for 2.5 A 120/250 V)

Temperature Range (Environmental)

30°F to 120°F (-1°C to 49°C) operating range

Signal Input

4-20 milliamperes (mAdc)

Input Channels

8 input channels; two wire 4-20 mA analog signal

Keypad

Membrane numeric keypad, five (5) function keys, positive tactile response

Power Output

24 Vdc nominal; fused @ 0.5 Amp

Input Impedance (Resistance)

120 ohm nominal (2.4 Vdc drop @ 20 mAdc)

Memory

Nonvolatile 64kbit memory iButton

Digital Readout

Alphanumeric 0.3173 in. (8 mm) 16-character x 2-line LCD; numeric 8-digit (0-99999999 maximum)

Accuracy

±0.048% FS (±0.024% FS, typical)

Resolution

±0.024% FS maximum (±0.004 mA)

Communications

Two (2) serial EIA RS-485 ports; two wire multidrop

Setpoint Relays

Sixteen (16) independent user setpoints; two (2) setpoints per tank channel; SPDT (form-C) relays, maximum 3.0 A @ 115 Vac. Rated for minimum 100,000 cycle/life at rated load.; continuously adjustable over full input range.

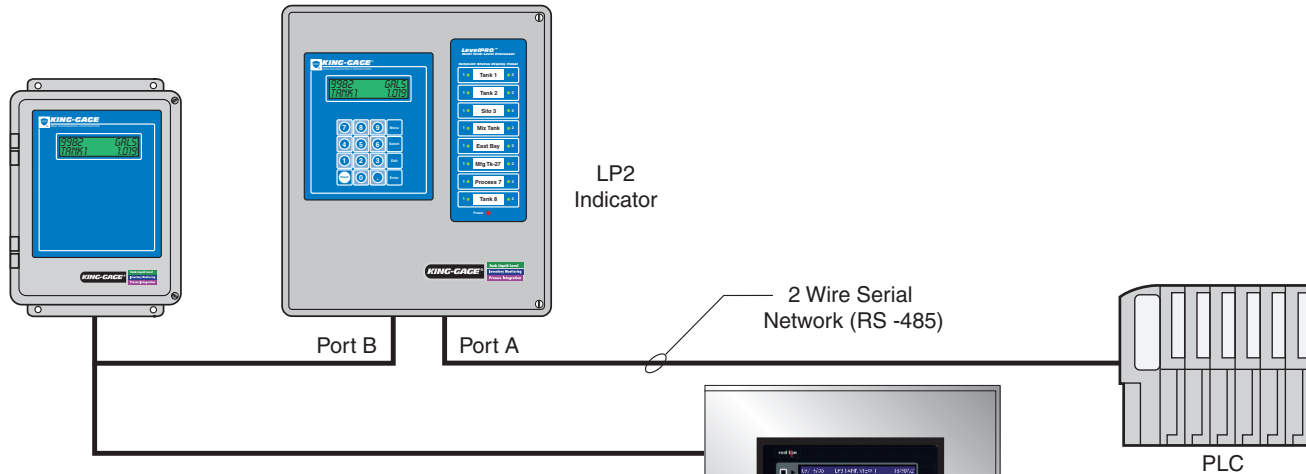
Status Display Panel

LED setpoint indicators for visual confirmation when individual SPDT relays are energized.

Housing

Fiberglass-reinforced polyester (FRP) enclosure; U.L. listed (U.L. 508) types 3, 3R, 3S, 4, 4X, and 12.

Not Shown: Optional stainless steel (type 304) enclosure; overall maximum dimensions 5-1/2" H x 13" W x 6" D.



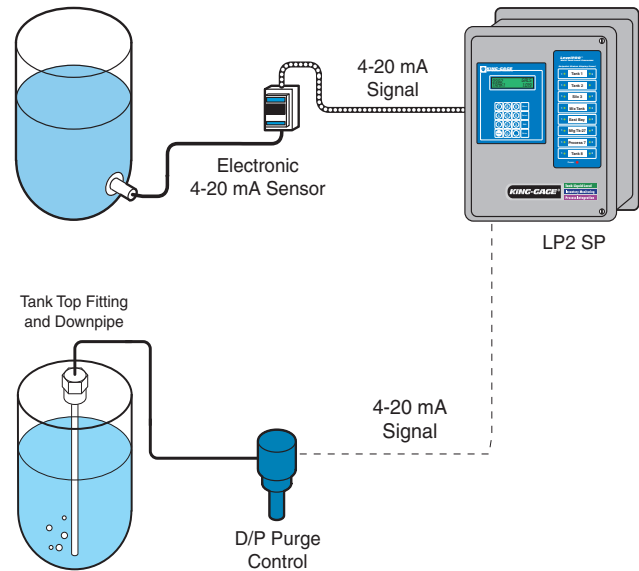
Data Acquisition and Network Connectivity

The local operator interface panel permits direct entry of density values, supervisory password protection, manual and automatic scanning display modes. An alphanumeric LCD panel provides 10-character tank identification with 8-digit display value and current density selection. Dual serial communications ports (RS-485) can be configured for different protocols such as master/slave, ASCII data exchange or Modbus-RTU emulation. This flexibility means that LP2 indicators can be simultaneously linked to different data networks.

Input Requirements

LP2 multiple tank indicators accept up to eight input channels that receive proportional 4-20 mA signals from liquid level transmitters. The actual sensor used to detect hydrostatic pressure (created by liquid depth) can be either electronic or pneumatic. With the latter, an electronic pressure transmitter is used to convert the sensor's pneumatic signal into 4-20 mA output (using a KING-GAGE® D/P Module or D/P Transmitter).

The LP2 tank indicator incorporates an internal 24 Vdc supply that can be used to power the signal loop. The voltage supply can be set as enabled or disabled for each individual signal input channel. This can be done to accommodate an external power supply (occasionally tied through the I/O card of a PLC).



* iButton is a trademark of Dallas Semiconductor.

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