

## Acid Storage Tank Level Indication

### SITUATION

- Silicon foundry experiencing repeated failure with in tank sensors for tanks holding concentrated levels of sulfuric and nitric acid.
- Service life of the tank mounted sensors and sensor components exposed to the acids was unacceptably short.
- Tank level sensor replacement was very costly and hazardous.
- Sensors need to monitor tank levels and interface with the existing SCADA system.
- A local display showing level indication and system condition was a preferred option.



### CHALLENGE

The tanks stored concentrated sulfuric and nitric acid solutions for use in the plants processes.

Tank sensor failure had resulted in production process problems and at times overflow of acids in the tanks. Reliable and accurate level information and system status needed to be continually available for the plant SCADA system operators to safely monitor these tanks.

Replacing sensors was a hazardous operation, costly in both money and production time and was required to be done every six months on average.

### SOLUTION

The LevelCom LC-100 pulsed bubbler uses pneumatic tubing inside the tank to sense liquid levels. The tubing material is chosen to be chemically compatible with the tank contents.

The sensing electronics in the LC-100 reside in the units NEMA 3R enclosure and are never in proximity to the tank (up to 600 feet away) eliminating problems with both physical and vapor caused chemical corrosion.

The analog, 4-20 mA output enables the LevelCom 100 to send a real time signal to the SCADA system for monitoring and recording the level of acid in the tank. All LC-100 have a local display consisting of a 100 segment bar graph showing tank level as a per cent of capacity and a digital numerical display showing of tank level in engineering units of choice English / Metric. The display provides redundancy in the event of failure of the SCADA system.

The LevelCom 100 has been in service for over 12 years and has provided trouble free service for this company.

*TMS has been manufacturing LevelCom products for 20 years. Originally developed for the offshore and marine markets where there is little tolerance for failure and no available parts or service, LevelComs have an over 20 year proven record for being a robust, accurate tank level indicating system that always works.*

## OPTIONS

<b>Depth Range — Ft.</b>	0–32	0-62	0-92	0-180
<b>Meters</b>	9.45	18.9	27.43	54.86
<b>Communication</b> <b>RS 232 / 422 / 485</b>	Modbus	Profibus	Modbus TCP/IP	Analog & Modbus
<b>Alarm &amp; Control Relays</b>	4 programmable internal set points, Control 1 & 2, On / Off; 2 – SPDT Form C relays (“rated “Pilot Duty”)			
<b>Analog Output</b>	4 to 20 mA			
<b>Automatic Specific Gravity</b>	Requires 2nd bubbler tube installation			
<b>Differential Pressure</b>	Requires 2nd bubbler tube installation			
<b>Alarm Horn</b>	Integral piezoelectric alarm horn			
<b>Digital Communication</b>	For Use with LC101 for Secondary Remote Readout			
<b>Panel / Cabinet Fabrication</b>	Made to customer specifications, complete with tubing, regulator and wiring			

## SPECIFICATIONS

<b>Approvals</b>	ABS Type Approval, UL Listed, ISO 9001 Certified Manufacturer			
<b>Power</b>	120VAC / 100mA / Fuse – 2A; 24 VDC / 500mA / Fuse—2A			
<b>Supply Air</b>	Regulated pressure varies with input sensor range (see below). Filtered to 40 microns			
<b>Temperature</b>	Operating range: -20° F to +140° F (-28.88° C to +60° C)			
<b>Enclosure</b>	UL listed NEMA 3R - Powder coated aluminum alloy with 304 stainless steel fasteners			
<b>Fittings</b>	Brass or 316 Series Stainless Steel			
<b>Dimensions</b>	14.5” (37cm) H x 5.5” (14cm) W x 3.8” (9.6cm) D			
<b>Alarm Set Points</b>	Four (4) programmable internal set points (Relay option required for remote alarm activation)			
<b>Control Set Points</b>	Four (4) programmable set points (Control 1 & 2 On/Off) (Relay option required)			
<b>Security</b>	User defined 1 - 9 character password protection			
<b>Tank Sensing Range (H<sub>2</sub>O)</b>	0 - 31 ft. (9.45m)	0 - 62 ft. (18.9m)	0 - 90 ft. (27.43m)	0 - 180 ft. (54.86m)
<b>Accuracy (Full Scale)</b>	+/-0.2% FS (+/-0.75”)	+/-0.2% FS (+/-1.5”)	+/-0.2% FS (+/-2.2”)	+/-0.1% FS (+/-2.2”)
<b>Resolution (Full Scale)</b>	0.1” (2.54mm)	0.2” (5.08mm)	0.3” (7.62mm)	0.1” (7.62mm)
<b>Supply Air Pressure</b>	20 - 35 psi	30 - 50 psi	45 - 60 psi	85 - 100 psi