

# Senix ToughSonic® CHEM 14 Level Sensor

## Read Liquids or Solids in Chemically Aggressive Environments

**CHEM** series sensors and SenixVIEW software put the power of ultrasonics in your hands. Adjust, optimize, save and clone your applications quickly without calibration!

These sensors are contained in a rugged, chemically inert PVDF sealed housing for long life. They mount above the material surface and measure distance downward without contact. All outputs respond simultaneously to the measured distance.

Applications include pump control, bulk inventory, flumes/weirs, batch processing, water management and high/low level alarms.



↓ **SenixVIEW PC Software included!**

**Non-Contact Ultrasonic Distance & Level Measurement**

**TOUGHSONIC®**  
Tough. Smart. Connected.

### Features

#### Level Measurement

- Long and short measurement
- Temperature compensation
- Unaffected by liquid color, density and transparency
- Remotely adjustable via PC

#### Packaging & Performance

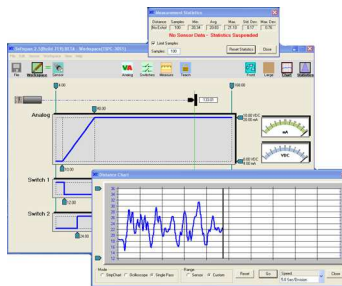
- Durable housing for long life
- Top and bottom thread mounts
- Short & overload protected I/O
- Adjustable filters compensate for tank mixers or turbulence
- Adjustable sensitivity

#### Functionality Beyond Sensing

Adjustable interface features like switch hysteresis and time delays offer solutions for basic level alarms and pump controls without additional hardware.

### PC Setup Power!

Use SenixVIEW software (see separate data sheet) to adjust all sensor features. View, analyze or log data to optimize your application. Setups are unaffected by power interruption.



#### Copy without Calibration

Application setups can be saved for future recall. From a single sensor inventory part you can quickly clone sensors, without recalibration, for any number of different field installations.

### Connections

#### Serial Data Interface

Used for SenixVIEW setup or user device communication. Choose either an RS-232 or RS-485 model.

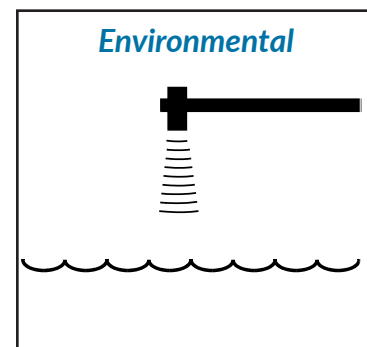
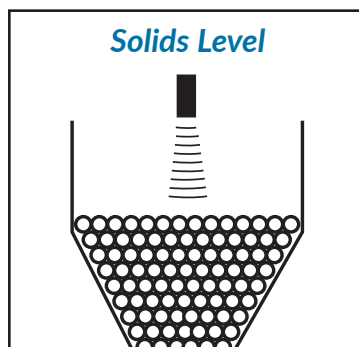
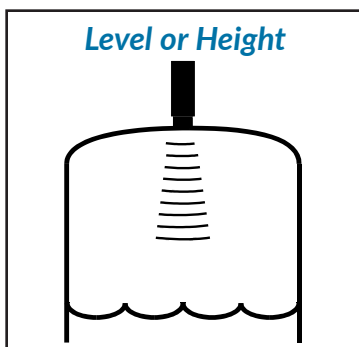
#### Analog Outputs (3)

Includes voltage (0-10 VDC) and two current loops (4-20 mA sinking and sourcing). Both output types have user-selectable voltage/current ranges and endpoints for best resolution. The output slope is easily inverted.

#### Switches (2)

Each switch is configurable as "PNP" or "NPN" type (sourcing or sinking), with adjustable set point, hysteresis, window, initial conditions, ON delay, OFF delay and loss of target response. These are commonly used for level controls and alarms.

*All interfaces operate concurrently.*





## ToughSonic® CHEM 14 Level Sensor

### Specifications

<b>Optimum Range</b>	10 ft. (3 m)	<b>Max Range</b>	14 ft. (4.3 m)
<b>Deadband</b>	Typ. < 3.5 in. (89 mm)	<b>Adjustment</b>	SenixVIEW software
<b>Case Material</b>	PVDF	<b>Configuration</b>	Stored in non-volatile memory
<b>Temperature</b>	-40 to 158 F (-40 to 70 C)	<b>Outputs</b>	Five selectable, plus serial data
<b>Humidity</b>	0 to 100% operating	<b>Transducer</b>	Rugged piezoelectric
<b>Compensation</b>	Temperature compensated	<b>Protection</b>	NEMA-4X, NEMA-6P, IP68
<b>Resolution</b>	Digital: 0.0034 in. (0.086 mm); Analog: 4099 steps (0-10 VDC), 3279 steps (4-20 mA)		
<b>Repeatability</b>	Closer than 50 in. (1.3m) ±0.008 in. (±0.2 mm); farther ±0.015% of range (flat perpendicular target)		
<b>Update Rate</b>	20 Hz (50 ms), SenixVIEW adjustable; affected by SenixVIEW filter selections		
<b>Input Power</b>	10-30 VDC, 50 mA maximum, not including switch and analog output currents when used		
<b>Voltage Output</b>	0-10, 0-5 VDC or PC customized; 10 mA max. (*)		
<b>Current Loop #1</b>	Current sourcing 4-20 mA or PC customized, max. loop 450Ω (*)		
<b>Current Loop #2</b>	Current sinking 4-20 mA or PC customized, max. loop 450Ω (*)		
<b>Sinking Switch</b>	150 mA max. @ 40 VDC max., teachable set point & polarity, fault indication		
<b>Sourcing Switch</b>	150 mA max. @ input voltage, teachable set point & polarity, fault indication		
<b>RS-232, RS-485</b>	Modbus and ASCII protocols, 9600-115200 baud (selectable), 8 data bits, 1 stop, no parity		
<b>Target Requirements</b>			
<b>Target</b>	Detects flat or irregular surfaces. Target surface must reflect sound back to sensor.		
<b>Max. Distance</b>	Affected by size, shape, orientation of target (sound level reflected back to sensor), environment Restrict use to Optimum Range when using over a wide range of environmental conditions		
<b>Granular Solids</b>	De-rate max range by 50%; range affected by material density and orientation		
<b>Optical</b>	Unaffected by target color, light level, transparency or other optical characteristics		

### Connections

Cable Connection	Wire	Description
<b>Power</b>	Brown	10-30 VDC, 50 mA maximum; Typical: 45 mA @ 24 VDC (**)
<b>Ground</b>	Blue	Power and interface common
<b>Voltage Output *</b>	Violet	0-10 VDC, 0-5 VDC or custom end values between 0 and 10 VDC
<b>Current Loop Output *</b>	Green	4-20 mA sourcing (adjustable end values between 4 and 20 mA)
<b>Current Loop Output *</b>	Orange	4-20 mA sinking (adjustable end values between 4 and 20 mA)
<b>Switch #1 Output</b>	Black	Sinking ("NPN") or Sourcing ("PNP"), user selected
<b>Switch #2 Output</b>	White	Sinking ("NPN") or Sourcing ("PNP"), user selected
<b>RS-232 out / RS-485-</b>	Gray	Serial data connection (depends on model - see model selection)
<b>RS-232 in / RS-485+</b>	Yellow	Serial data connection (depends on model - see model selection)

(\*) Analog outputs share common distance endpoints. Both 4-20 mA outputs share the same adjustable max / min values. The maximum loop resistance is derated below 15 VDC input voltage.

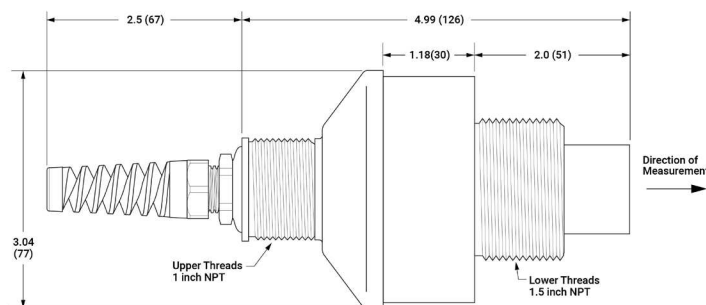
(\*\*) At default update rate. Output currents not included. Sensitivity reduced below 15 VDC input voltage.

### Part Numbers

Model Number	Description
LVL-140-232	RS-232 serial data interface
LVL-140-485	RS-485 serial data interface (allows addressable multi-sensor networks)
LVL-140-485A	RS-485 serial data only (allows addressable multi-sensor networks)

Senix offers accessories and special assembly options for OEM customers to suit specific needs.

### Dimensions



#### Mechanical

##### Mounting Threads:

Lower: 1.5 in. NPT  
Upper: 1 in. NPT

##### Attached Cable:

PUR jacket, 6.5 ft. (2 m),  
strain relieved

##### Weight:

21.2 oz. (0.60 kg)