

# TOUGHSONIC<sup>®</sup> CHEM 20

## ULTRASONIC LEVEL & DISTANCE SENSOR

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### DESCRIPTION

The Toughsonic Chem Ultrasonic Sensors are the more rugged version of the Toughsonic General purpose line, suitable for use in diesel fuels and chemical level applications in closed or open tanks. These durable, compact ultrasonic level sensors measure a wide variety of liquids from diesel fuel in rail locomotives to chemical tanks in the paper and food processing industries. The Toughsonic Chem 20 sensor provides non-contact measurements at distances up to 20 feet (6.1m), with an optimum range of 8 to 156 inches (200mm to 4m). Heavy duty electronics are epoxy potted into a polyvinylidene fluoride (PVDF) housing that physically isolates the transducer and electronics from chemicals and can withstand exposure to both acids and bases.

### APPLICATIONS

- PVDF Housing for more rugged environments
- Can withstand exposure to variety of fuels, acids and bases
- Optimal Measuring Range: 8 inches - 156 inches (200mm to 4m)
- Voltage & 4-20mA outputs
- Operating Temperature: -40 to +158°F (-40 to +70°C)
- RS-232 & RS-485 Communication protocols

## PERFORMANCE SPECIFICATIONS

|                        |   |                      |  |
|------------------------|---|----------------------|--|
| <b>Optimum Range</b>   | 80 in. (2 m)  | <b>Max Range</b>     | 20 feet (6.1 m)  |
| <b>Deadband</b>        | Typ. < 4 in. (100 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 Rugged piezoelectric |
| <b>Humidity</b>        | 0 to 100% operating   | <b>Transducer</b>    | NEMA-4X, NEMA-6P, IP68                                 |
| <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>   | Greater of +/-0.03 in. (0.76 mm) or 0.2% of target distance in stable environment   |                      |  |
| <b>Update Rate</b>     | 20 Hz (50 ms), SenixVIEW adjustable; affected by SenixVIEW filter selections        |                      |  |
| <b>Voltage Output</b>  | 10-30 VDC, 50 mA maximum (not including output currents)                            |                      |  |
| <b>Current Loop #1</b> | 0-10, 0-5 VDC or PC customized; 10 mA max. (*)                                      |                      |  |
| <b>Current Loop #2</b> | Current sourcing 4-20 mA or PC customized, max. loop 450Ω (*)                       |                      |  |
| <b>Sinking Switch</b>  | Current sinking 4-20 mA or PC customized, max. loop 450Ω (*)                        |                      |  |
| <b>Sourcing Switch</b> | 150 mA max. @ 40 VDC max., teachable set point & polarity, fault indication         |                      |  |
| <b>RS-232, RS-485</b>  | 150 mA max. @ input voltage, teachable set point & polarity, fault indication       |                      |  |
|                        | Modbus protocol, 9600-115200 baud (selectable), 8 data bits, 1 stop, no parity      |                      |  |

### Target Requirements

|                        |  |
|------------------------|--|
| <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<br>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>         | Orient sensor beam perpendicular to target surface for best performance  |

## CABLE CONNECTIONS

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

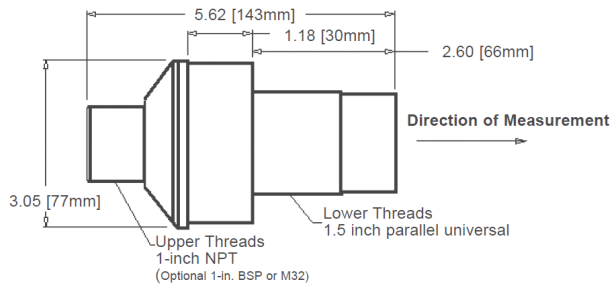
*Specifications subject to change without notice. This product is not recommended for applications with hazardous or explosive materials, or as a primary device for personal safety*

## PART NUMBERS

| Model Number | Description  |
|--------------|--|
| LVL-100-232  | Serial RS-232 interface (PC COM port compatible)                   |
| LVL-100-485  | Serial RS-485 interface (allows addressable multi-sensor networks) |

Senix also offers interconnection, communication, mounting, and display components

## DIMENSIONS



### Mechanical

#### Mounting Threads:

Lower 1-1/2-in. Parallel

Upper 1-in. NPT

(1 in. BSP tapered, or M32 x 1.5 metric by special order)

#### Attached Cable:

PUR jacket, 6.5ft (2 m) long

#### Weight:

21.2 oz. (0.60 kg)

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