

# ToughSonic® 12 Level Sensor (NPT)

## Chemically Resistant, Two Outputs + Data Communications

TSPC-N1S1 Series

**TSPC** sensors with SenixVIEW software put the power of ultrasonics in your hands yet retain the simplicity of push-button TEACH setup. You can quickly adjust, optimize, save and clone your applications without calibration!

ToughSonic sensors contain a rugged transducer potted in a stainless steel housing for long life.

Outputs respond to measured distance and non-contact technology means nothing touches your materials.

Many applications exist in all industries. Contact Senix today to discuss your specific needs.

### Non-Contact Ultrasonic Liquid Level Measurement (NPT threaded)

#### Features

##### Distance Measurements

- Long range, short dead band
- Unaffected by optical factors like color and transparency
- PC or button "teachable" setup
- Narrow beam with adjustments to optimize performance
- Temperature compensated

##### Packaging & Performance

- Quick mounting
- Durable sealed housing for wet or dirty applications
- Short & overload protected I/O
- Multi-sensor synchronization
- Adjustable sensitivity
- Rear status indicators (3)

**Free Functionality** using adjustable interface features like switch hysteresis and time delays to build complete solutions such as pump or material flow controllers. Save cost by eliminating PLCs, delay circuits and time delay relays!

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



Up to 12-ft. (3.7 m) maximum range  
in IP68 rated SS316 housing

SenixVIEW PC  
Software included!

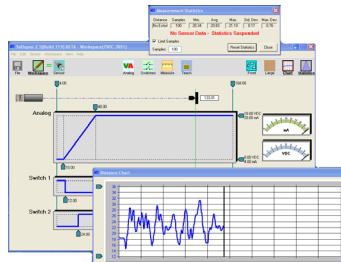
1-in NPT thread

PVDF transducer



#### PC Setup Power!

Use SenixVIEW software (see separate data sheet) to select and adjust all interfaces, timing parameters, filters and modes. Then view, analyze or log data to optimize your application.



**Flexible configuration** means fewer parts to stock and quick duplication! Higher volume OEM options are available.

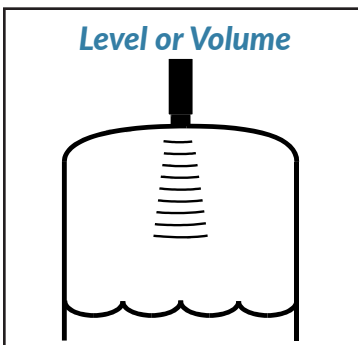
**Push-button "teach"** features provide for several common adjustments when a PC is not available.

#### Output Selection

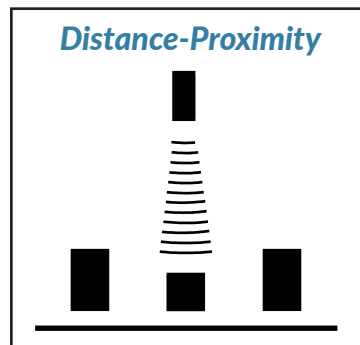
In addition to the model's RS-232 or RS-485 serial data interface there are two SenixVIEW selected outputs to suit your application. All outputs have configurable endpoints, setpoints, event responses and time delays.

**Voltage & Current Loop** are both provided simultaneously in standard (0-10 VDC, 4-20 mA) or custom ranges. They are fully configurable and can either rise or fall with increasing distance.

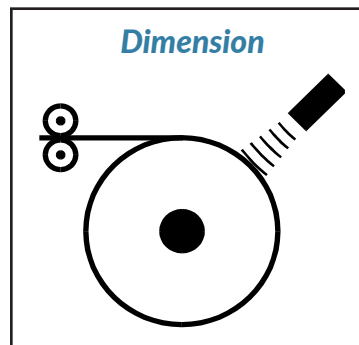
**Switches** can be selected in lieu of one or both analogs, and set to either "PNP" or "NPN" type (sourcing or sinking). Each has independently adjustable set point, hysteresis, window, initial conditions, ON delay, OFF delay and loss of target response for ultimate flexibility.



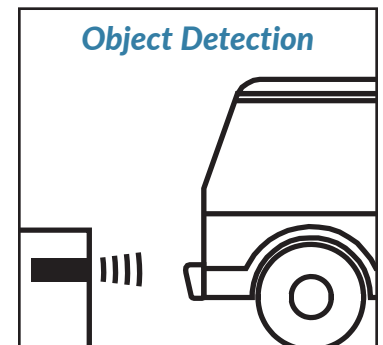
Level or Volume



Distance-Proximity



Dimension



Object Detection



## ToughSonic® 12 Level Sensor with NPT Threads

### Specifications

<b>Optimum Range</b>	8 ft. (2.4 m)	<b>Max Range</b>	12 feet (3.7 m)
<b>Deadband</b>	Typ. < 3 in. (76 mm)	<b>Adjustment</b>	Button "teach" or SenixVIEW
<b>Case Material</b>	316 stainless steel	<b>Configuration</b>	Stored in non-volatile memory
<b>Temperature</b>	-40 to 158 F (-40 to 70 C)	<b>Outputs</b>	Two selectable, plus serial data
<b>Humidity</b>	0 to 100% operating	<b>Transducer</b>	Ruggedized piezoelectric, PVDF (Kynar)
<b>Compensation</b>	Temperature compensated	<b>Protection</b>	NEMA-4X, NEMA-6P, IP68
<b>Resolution</b>	Serial data: 0.0034 in. (0.086 mm); Analog: 4099 steps (0-10 VDC), 3279 steps (4-20 mA)		
<b>Repeatability</b>	Nominal 0.2% of range @ constant temp. Affected by target, distance, environment		
<b>Update Rate</b>	20 Hz (50 ms), SenixVIEW adjustable; also affected by SenixVIEW filter selections		
<b>Output Selection</b>	Voltage & 4-20 mA current loop (defaults), switches, or a combination; see CONNECTIONS below		
<b>Voltage Output</b>	0-10, 0-5 VDC or PC customized, 10 mA max; also push-button teachable endpoints		
<b>Current Loop</b>	4-20 mA or PC customized, current sourcing, max. loop 450Ω, teachable endpoints		
<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 protocol, 9600 to 115200 baud, 8 data bits, 1 stop, no parity		
<b>SYNC feature</b>	Permits up to 32 sensors to operate in close proximity without interaction		
<b>Target Requirements</b>			
<b>Objects</b>	Detects flat or curved objects. Surface must reflect ultrasound 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>Orientation</b>	Flat surfaces should be oriented perpendicular to sensor output beam		
<b>Optical</b>	Unaffected by target color, light, transparency or other optical characteristics		

### Connections

Cable Connection	Wire	Description
<b>Power</b>	Brown	10-30 VDC @ 60 mA maximum; Typical: 45 mA @ 24 VDC (**)
<b>Ground</b>	Blue	Power and interface common
<b>Voltage Output</b>	White *	0-10 VDC, 0-5 VDC or custom end values between 0 and 10 VDC
<b>Current Loop Output</b>	Black *	4-20 mA or user adjusted 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 part numbers)
<b>RS-232 in / RS-485+</b>	Yellow	Serial data connection (depends on model - see part numbers)

(\*) Outputs on the black and white wires are SenixVIEW selected. The black wire options are 4-20 mA current loop or switch.

White wire options are 0-10 VDC or switch. Switches can be sourcing or sinking. Max current loop resistance is derated below 15 VDC input voltage.

(\*\*) At default update rate. Output currents not included.

### Part Numbers

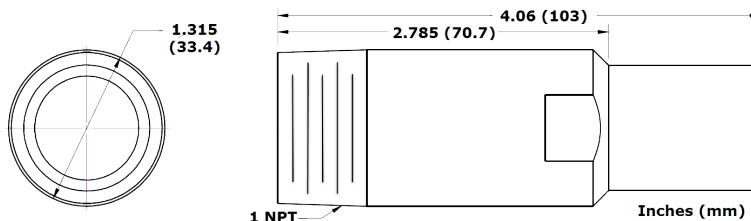
Model Number	Description
TSPC-N1S1K-485	Analog, switch and RS-485 serial interface (allows addressable multi-sensor networks)
TSPC-N1S1K-485A *	Same as above but with only RS-485 serial data interface *
TSPC-N1S1K-232	Analog, switch and RS-232 serial data interface (PC COM port compatible)
TSPC-N1S1K-232A *	Same as above but with only RS-232 serial data interface *

These products are also available with a 30 mm threaded body. See ToughSonic 12 data sheet.

\* Models with "A" suffix have only serial data; Analog & switch outputs, pushbutton and interface LEDs are removed.

Senix also offers interconnection, communications, mounting and display accessories.

### Dimensions



#### Mechanical

Dimensions are in inches (mm)

Standard Cable: 6.5ft (2m)

Ships with instructions

Total Weight: 14.2 oz (0.4 kg)