

# ToughSonic® 3 Level & Distance Sensor

Windows PC or Button Setup, Waterproof, Multiple Outputs

TSPC-30S2 Series

TSPC sensors and 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!

Built rugged as with all ToughSonic sensors, the ToughSonic 3 is designed to address close up and shorter working distance requirements. Narrow beam width and shortened minimum range gives close-up versatility.

Digital and analog outputs respond to measured distance. Non-contact technology means nothing touches your materials.

**Close-in  
& Narrow Beam  
Non-Contact  
Ultrasonic  
Distance & Level  
Measurement**

## Features

### Distance Measurements

- Short 1.75 inch 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!

1.75 in. to 3-ft. (4.5 - 91 cm) range in a 30 mm IP68 rated threaded housing

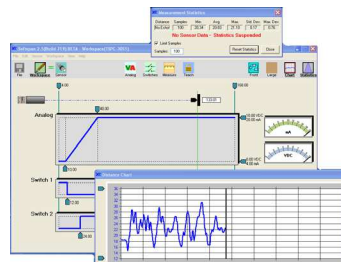


**SenixVIEW PC  
Software included!**



## 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.

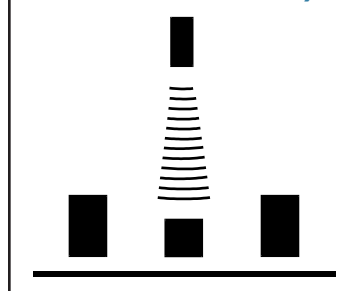
## Output Selection

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

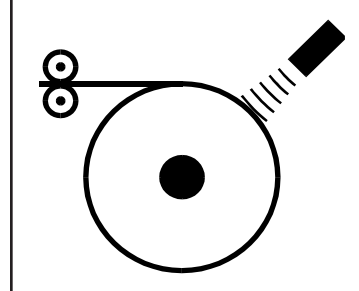
**Voltage & Current Loop** are both provided simultaneously in standard (0-10 VDC, 4-20 mA) or custom ranges. They are fully configurable and can either rise or fall with increasing distance.

**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.

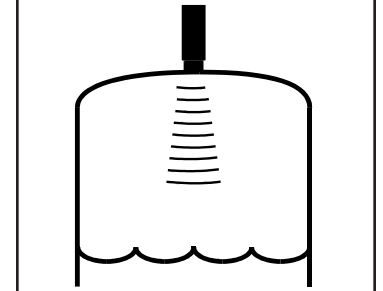
## Distance-Proximity



## Dimension



## Level or Volume



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

800 677 3649 802 489 7300 10516 Route 116 Suite 300, Hinesburg, VT 05461 USA

Fax: 802 489 7400 e-mail: sales@senix.com web: senix.com

**Senix**  
distance & level sensors



## ToughSonic® 3 Level & Distance Sensor

### Specifications

<b>Optimum Range</b>	24 in. (61 cm)	<b>Max Range</b>	36 inches (91 cm)
<b>Deadband</b>	Typ. < 1.75 in. (4.5 cm)	<b>Adjustment</b>	Button "teach" or SenixVIEW
<b>Case Material</b>	316 stainless steel, M30x1.5 threaded	<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>	5 to 95% (non-condensing)	<b>Transducer</b>	Ruggedized 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>	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 Select</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 (selectable), 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 back to sensor.		
<b>Max. Distance</b>	Affected by size, shape, orientation of target (sound level reflected back to sensor)		
<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 max; 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.

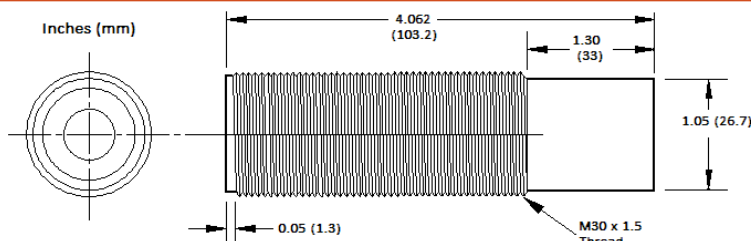
### Part Numbers

Model Number	Description
TSPC-30S2-485	Analog, switch and RS-485 serial interface (allows addressable multi-sensor networks)
TSPC-30S2-485A *	Same as above but with only RS-485 serial data interface *
TSPC-30S2-232	Analog, switch and RS-232 serial data interface (PC COM port compatible)
TSPC-30S2-232A *	Same as above but with only RS-232 serial data interface *

These products are also available with 1-inch NPT threads. See ToughSonic 3 NPT data sheet.

\* Models with "A" suffix are data communications only; Analog & switch circuits, pushbutton and interface LEDs are removed. Senix also offers interconnection, communications, mounting and display accessories.

### Dimensions



#### Mechanical

Dimensions are in inches (mm)  
 Hole diameter: 1.2 in. (30.5 mm)  
 Standard Cable: 6.5ft (2m)  
 Ships with instructions and two 30mm stainless mounting nuts (other options available)  
 Total weight: 10.32 oz. (0.29 kg)