



# ToughSonic<sup>®</sup> 14 Level & Distance Sensor

## Specifications

<b>Optimum Range</b>	10 ft. (3 m)	<b>Max Range</b>	14 feet (4.3 m)
<b>Deadband</b>	Typ. < 4 in. (100 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
<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 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)

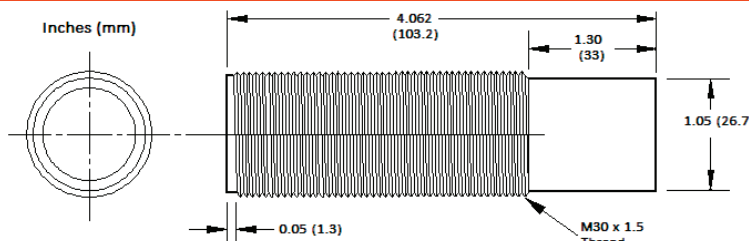
(\*) Outputs on the black and white wires are SenixVIEW selected. The black wire options are 4-20 mA current loop or switch. White wire options are 0-10 VDC or switch. Switches can be sourcing or sinking. Max current loop resistance is derated below 15 VDC input voltage.

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

## Part Numbers

Model Number	Description
TSPC-30S1-232	Serial RS-232 interface (PC COM port compatible)
TSPC-30S1-485	Serial RS-485 interface (allows addressable multi-sensor networks)

## 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: 10.4 oz (0.29 kg)

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## ToughSonic® 14 Level Sensor with NPT Threads

### Specifications

<b>Optimum Range</b>	10 ft. (3 m)	<b>Max Range</b>	14 feet (4.3 m)
<b>Deadband</b>	Typ. < 4 in. (100 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
<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

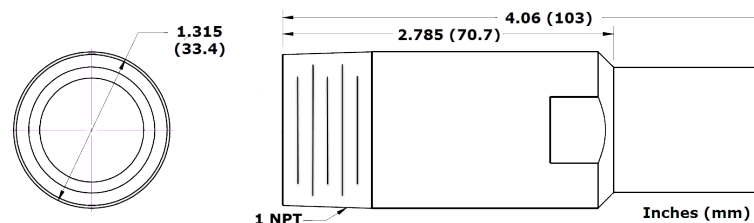
Model Number	Description
TSPC-N1S1-485	Analog, switch and RS-485 serial interface (allows addressable multi-sensor networks)
TSPC-N1S1-485A *	Same as above but with only RS-485 serial data interface *
TSPC-N1S1-232	Analog, switch and RS-232 serial data interface (PC COM port compatible)
TSPC-N1S1-232A *	Same as above but with only RS-232 serial data interface *

These products are also available with a 30 mm threaded body. See ToughSonic 14 data sheet.

\* Models with "A" suffix are data communications only; 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)