

TOUGHSONIC[®] 3



LEVEL SENSOR Windows PC or Button Setup, Waterproof, Multiple Outputs



1.75 in. to 3-ft. (4.5 - 91 cm)
range in a 1-inch NPT
IP68 rated threaded housing



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

DESCRIPTION

TSPC sensors and WhitmanVIEW 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 closeup versatility.

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

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

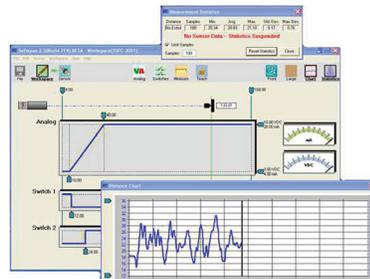
- Quick mounting
- Durable sealed housing for wet or dirty applications
- Short & overload protected I/O
- Multi-sensor synchronization
- Adjustable sensitivity
- Rear status indicators (3)

Functionality Beyond Sensing

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!

PC SETUP POWER!

Use **Whitman 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.

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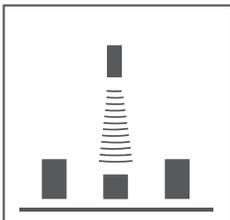
OUTPUT SELECTION

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

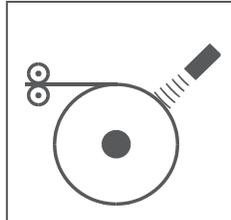
Voltage & Current Loop are both provided simultaneously in standard (0-10 VDC, 4-20 mA) or custom ranges. They are fully configurable and can either rise or fall with increasing distance.

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.

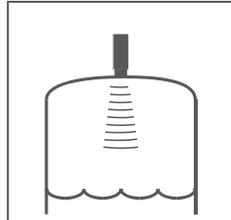
Distance-Proximity



Dimensions



Level or Volume



PERFORMANCE SPECIFICATIONS

Optimum Range	24 in. (61 cm)	Max Range	36 inches (91 cm)
Deadband	Typ. < 1.75 in. (4.5 cm)	Adjustment	WhitmanVIEW software
Case Material	316 stainless steel	Configuration	Stored in non-volatile memory
Temperature	-40 to 158 F (-40 to 70 C)	Outputs	Five selectable, plus serial data
Humidity	5 to 95% (non-condensing)	Transducer	Rugged piezoelectric
Compensation	Temperature compensated	Protection	NEMA-4X, NEMA-6P, IP68
Resolution	Digital: 0.0034 in. (0.086 mm); Analog: 4099 steps (0-10 VDC), 3279 steps (4-20 mA)		
Repeatability	Closer than 50 in. (1.3m) ±0.008 in. (±0.2 mm); farther ±0.015% of range (flat perpendicular target)		
Update Rate	20 Hz (50 ms), WhitmanVIEW adjustable; affected by WhitmanVIEW filter selections		
Output Select	Voltage & 4-20 mA current loop (defaults), switches, or a combination; see Connections below		
Voltage Output	0-10, 0-5 VDC or PC customized, 10 mA max; also push-button teachable endpoints		
Current Loop	4-20 mA or PC customized, current sourcing, max. loop 450Ω, teachable endpoints		
Sinking Switch	150 mA max. @ 40 VDC max., teachable set point & polarity, fault indication		
Sourcing Switch	150 mA max. @ input voltage, teachable set point & polarity, fault indication		
RS-232, RS-485	Modbus protocol, 9600 to 115200 baud (selectable), 8 data bits, 1 stop, no parity		
SYNC feature	Permits up to 32 sensors to operate in close proximity without interaction		

Target Requirements

Objects	Detects flat or curved objects. Surface must reflect ultrasound back to sensor.
Max. Distance	Affected by size, shape, orientation of target (sound level reflected back to sensor) Flat surfaces
Orientation	should be oriented perpendicular to sensor output beam Unaffected by target color, light,
Optical	Unaffected by target color, light, transparency or other optical characteristics

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 *	White*	0-10 VDC, 0-5 VDC or custom end values between 0 and 10 VDC
Current Loop Output *	Black*	4-20 mA or user adjusted 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 part numbers)
RS-232 in / RS-485+	Yellow	Serial data connection (depends on model - see part numbers)

(*) Outputs on the black and white wires are WhitmanVIEW 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-N1S2-485	Analog, switch and RS-485 serial interface (allows addressable multi-sensor networks)
TSPC-N1S2-485A *	Same as above but with only RS-485 serial data interface *
TSPC-N1S2-232	Analog, switch and RS-232 serial data interface (PC COM port compatible)
TSPC-N1S2-232A *	Same as above but with only RS-232 serial data interface *

These products are also available with a 30 mm threaded body. See ToughSonic 3 data sheet.

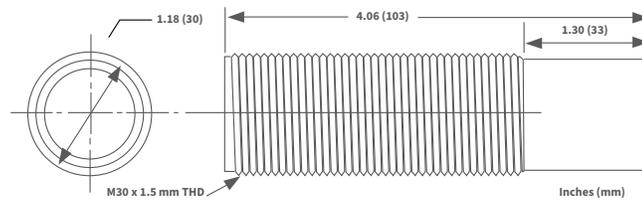
* Models with "A" suffix have only serial data; Analog & switch outputs, pushbutton and interface LEDs are removed.

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

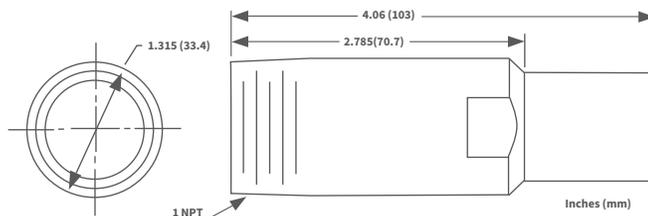
DIMENSIONS

Mechanical

Dimensions are in inches (mm)
 Standard Cable: 6.5ft (2m)
 Ships with instructions
 Total Weight: 14.2 oz (0.4 kg)



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)



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