

ToughSonic sensors and SensorView™ software put the power of ultrasonics in your hands. Quickly adjust, optimize, save, and clone your setups without calibration!

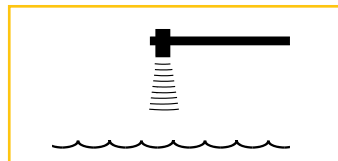
These sensors are housed in a single small potted enclosure for environmental durability and long life. They mount at a distance from a liquid or solid material and measure distance to the surface.

Sensor outputs respond to that measured distance. Applications exist in many industries, and include pump control, bulk inventory, high/low level alarms, river level for flood detection and much more.

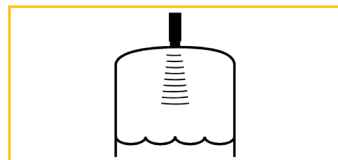
### Non-Contact Ultrasonic Distance & Level Measurement (2.5 Inch NPT)



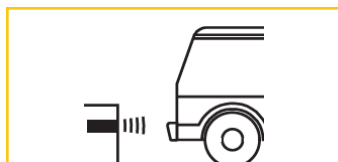
Distance-Proximity



Environmental



Level or Volume



Object Detection

### Features

#### Distance Measurements

- Long range, short dead band
- Continuous and point level
- Water or non-caustic materials
- Adjustable by computer (PC) software, locally or remotely
- Narrow beam with adjustments to optimize performance

#### Packaging & Performance

- Survives submersion
- Temperature compensation for improved accuracy
- Short & overload protected I/O
- Adjustable sensitivity
- Rear status indicators (3)

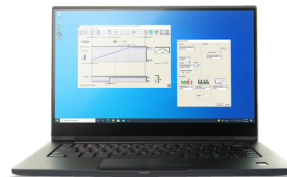
#### Free Functionality

Use 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!

#### PC Programming Software

Use SensorView™ 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

Flexible configuration means fewer parts to stock and quick duplication! Application setups can be stored on your PC and later recalled. Using a single inventory part you can quickly clone replacement sensors for any number of applications with re-calibration!

### Multiple Outputs

In addition to the model's RS-232 or RS-485 serial data interface, there are five simultaneous outputs. All have SensorView™ configurable features including ranges, target responses, and time delays.

#### Analog Outputs (3)

These include voltage (0-10 VDC) and two current loops (4-20 mA sinking and sourcing).

The analog slope can increase or decrease value with distance. The analog output limits can be set any distance, and have user-selected voltage/current values.

#### Switches (2)

Two switches are SensorView™ configurable as either "PNP" or "NPN" type (sourcing or sinking). Each has adjustable set point, hysteresis, window, initial conditions, ON delay, OFF delay, and loss of target response for ultimate flexibility.

## ToughSonic® TS-100.50 PVC Sensor

Windows PC Setup, Waterproof, Multiple Outputs

### Specifications

Optimum Range	33 ft. (10 m)	Max Range	50 ft. (15.2 m)
Deadband	Typ. < 12 inches (30.3 cm)	Adjustment	SensorView™ software included
Case Material	PVC, 2-1/2" NPT THD front & rear	Configuration	Stored in non-volatile memory
Temperature	-40° to 158° F (-40° to 70° C)	Outputs	Two selectable, plus serial data
Humidity	0 to 100% operating	Transducer	Ruggedized piezoelectric
Compensation	Temperature compensated	Protection	NEMA-4X, NEMA 6P, IP68
Resolution	Serial data: 0.0135 in. (0.3438 mm); Analog steps: 4099 (0-10 VDC), 3279 (4-20 mA)mmA)		
Repeatability	Nominal 0.2% of range @ constant temp. Affected by target, distance, environment		
Update Rate	5 Hz (200 ms), SensorView™ adjustable; affected by SensorView™ filter selections		
Voltage Output	0-10, 0-5 VDC or PC customized; 10 mA max. (*)		
Current Loop #1	Current sourcing 4-20 mA or SensorView™ adjustable, max. loop 450Ω (*)		
Current Loop #2	Current sinking 4-20 mA or SensorView™ adjustable, max. loop 450Ω (*)		
Sinking Switch	150 mA max. @ 40 VDC max., adjustable set point & polarity, fault indication		
Sourcing Switch	150 mA max. @ input voltage, adjustable set point & polarity, fault indication		
RS-232, RS-485	Modbus protocol, 9600-115200 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), environment Restrict use to Optimum Range when using over a wide range of environmental conditions
Orientation	Flat surfaces should be oriented perpendicular to sensor output beam
Optical	Unaffected by target color, transparency, light, or other optical characteristics

### Connections

Cable Connection	Wire	Description
Power	Brown	10-30 VDC @ 70 mA maximum; Typical: 45 mA @ 24 VDC (**)
Ground	Blue	Power and interface common
Voltage Output *	Violet	0-10 VDC, 0-5 VDC, or SensorView™ adjustable voltage end values
Current Loop Output *	Green	4-20 mA sourcing (SensorView™ adjustable current end values)
Current Loop Output *	Orange	4-20 mA sinking (SensorView™ adjustable current end values)
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)

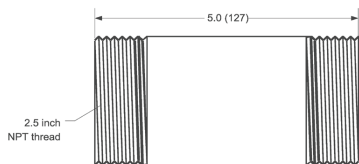
(\*) Analog outputs share common distance endpoints. Both 4-20 mA outputs share the same adjustable max / min end values. The maximum loop resistance is derated below 15 VDC input voltage.

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

### Part Numbers

Model Number	Description
TS-100.50F1X.007FA (Legacy: TSPC-25P-485)	50 ft (15.2m), 2.5" NPT front & rear mount, PVC housing, RS-485 & Analog (9 Wire), 6.5 ft (2m) cable length
TS-100.50F2X.007FA (Legacy: TSPC-25P-485A)	50 ft (15.2m), 2.5" NPT front & rear mount, PVC housing, RS-485 Only (4 Wire), 6.5 ft (2m) cable length
TS-100.50F1X.007FB (Legacy: TSPC-25P-232)	50 ft (15.2m), 2.5" NPT front & rear mount, PVC housing, RS-232 & Analog (9 Wire), 6.5 ft (2m) cable length
TS-100.50F2X.007FB (Legacy: TSPC-25P-232A)	50 ft (15.2m), 2.5" NPT front & rear mount, PVC housing, RS-232 Only (4 Wire), 6.5 ft (2m) cable length

### Dimensions



### Mechanical

- Lower Mounting: 2-1/2 in. NPT
- Upper Mounting: 2-1/2 in. NPT
- Attached Cable: PUR jacket, 6.5ft (2m) long
- Weight: 29.1 oz (0.82 kg)