

# ToughSonic® Distance Sensors

## Waterproof, Two Outputs and Push-Button "Teachable"

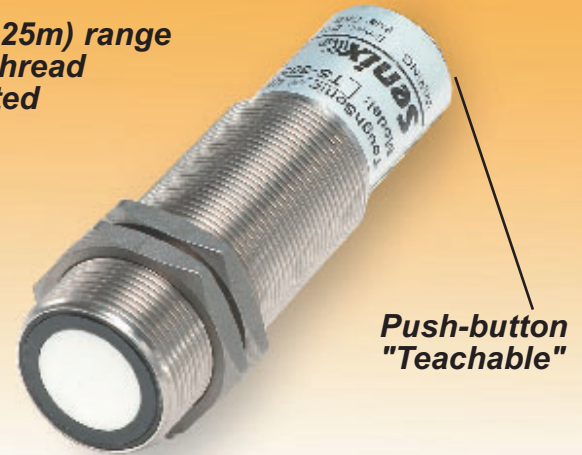
TS-30S1 Series

Non-Contact  
Ultrasonic  
Air Distance  
Measurement

TS-30S1 ultrasonic distance sensors contain a rugged transducer in a stainless steel case for long service life in tough environments. Typical applications include roll diameter, liquid level, motion control, positioning and dimensioning. They are excellent in tanks, drums and level applications.

Two outputs are available in many combinations, including analog 0-10/0-5 VDC, 4-20 ma. current loop, PNP (sourcing) switches, NPN (sinking) switches and RS-232/485 serial data. All outputs are relative to measured distance, any slope and anywhere in the sensor's range.

14-ft (4.25m) range  
30mm thread  
IP68 rated



Push-button  
"Teachable"

### Features

- Sealed for ingress protection rating IP68 for washdown or outdoor applications like food processing or car washes
- Narrow ultrasonic beam to avoid unwanted obstacles
- Long 14-ft (4.25 m) measurement range
- Short 4-in (10 cm) deadband
- Simple pushbutton "teachable" setup of many features, and calibration using actual targets
- Analog outputs are distance-proportional and adjustable anywhere in sensor's range
- Switch outputs have adjustable distance and polarity
- Output response filter for stability with poor targets
- Sync connection for several sensors in close proximity
- Security "Lock" prevents accidental mis-adjustment
- Status indicator for each output

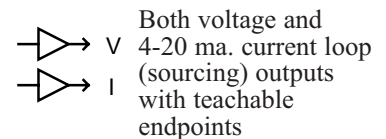
### Reliable Operation

- Unaffected by optical factors like color and transparency
- Stable output if target is lost
- Overload and short circuit protected switch & analog outputs
- Heavy duty 303 stainless case, 30x1.5 mm threaded, potted, waterproof with IP68 rating
- Temperature compensated

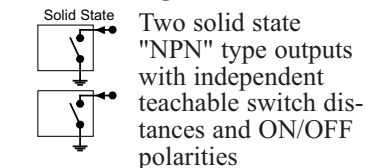
### Output Options

Here are 3 common TS-30S1 output configurations. Eight other output combinations are available (see next page).

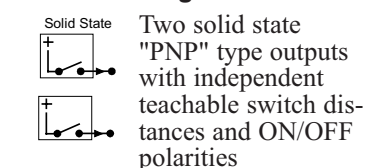
#### Two Analogs



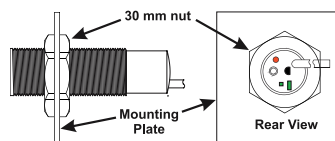
#### Two Sinking Switches



#### Two Sourcing Switches

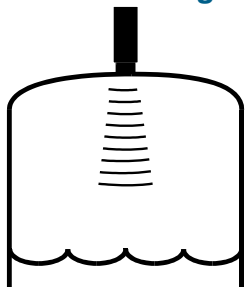


### Easy Installation

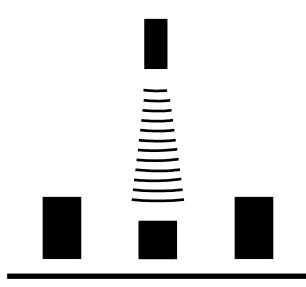


- Quick bolt-in mounting
- Permanently attached cable
- 3 rear LED's display target, fault and output status
- Simple push-button setup - no potentiometers!

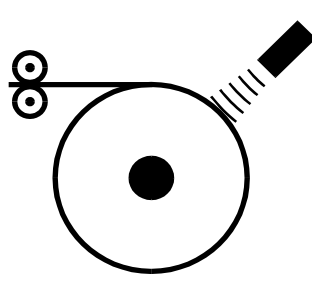
#### Level or Height



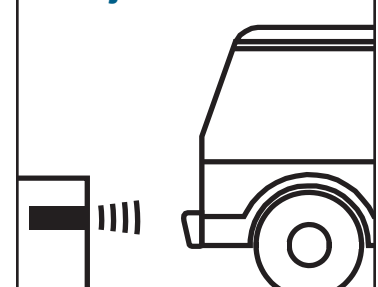
#### Dimension/Sort



#### Roll Diameter

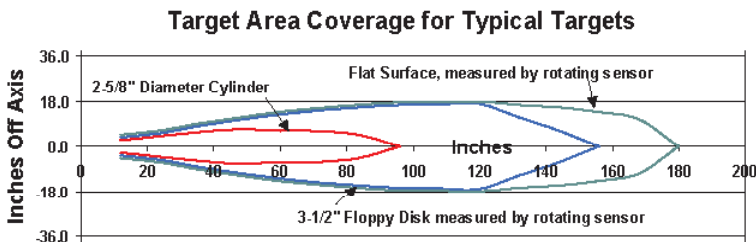


#### Object Detection



# TS-30S1 Two Output Teachable Distance Sensors

## Target Performance



**Color/Transparency**  
Unaffected by color, transparency or optical characteristics.

**Orientation**  
Detects flat or curved objects. Surface must reflect back to sensor. Flat surfaces are best when perpendicular to beam axis, and may not be detected at high angles of incidence.

### Typical Distances

Angle off perpendicular (+/-) vs. distance (ft.), large flat surface	
<b>Ft:</b>	1 2 3 4 5 6 7 8 9 10 11 12 13 14
<b>Deg:</b>	17 13 13 12 12 11 10 10 9 8 6 5 5 4

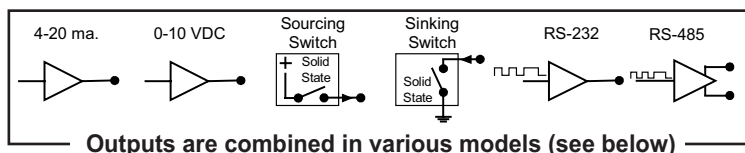
Object	Max Range (ft.)
2-5/8-in. diam. cylinder	7
3.5-in. floppy disk	10
Liquid surface	14

## Specifications

<b>Range</b>	4-168 in. (102mm - 4.25 m)	<b>Input Power</b>	10-30 VDC @ 70 ma. nominal 15-30 VDC if using analog output
<b>Case Material</b>	303 stainless steel	<b>Transducer</b>	Ruggedized piezoelectric
<b>Temperature</b>	-40 to 70 C (-40 to 158 F)	<b>Adjustments</b>	Push-button, permanently stored
<b>Protection</b>	NEMA-4X, NEMA-6P, IP68	<b>Humidity</b>	0 to 100% operating
<b>Resolution</b>	0.003384 in. (.086 mm) max.; Analog 12 bits (4095 steps) over spanned distance		
<b>Repeatability</b>	Nominal 0.1% of range @ constant temp. Affected by target, distance, environment		
<b>Compensation</b>	Temperature compensated, rear temperature sensor		
<b>Update Rate*</b>	20 (default), 33, 50 or 200 per second, selectable* output response time filter		
<b>Voltage Output*</b>	0-10 and 0-5 VDC (user selectable), 10 ma. max., reversable teachable endpoints		
<b>Current Loop</b>	4-20 ma. (sourcing), 500Ω max. @ >15 VDC, reversable teachable endpoints		
<b>Switch Outputs</b>	150 ma. max, sinking 40 VDC max., teachable setpoint and polarity, fault indication		
<b>RS-232, RS-485</b>	6 bytes, 9600 baud, 8 data bits, 1 stop bit, no parity, transmitted at update rate		
<b>SYNC feature</b>	Permits up to 32 sensors to be wired together for operation in the same area		

Asterisk (\*) indicates user teachable using pushbutton.

## Models & Outputs



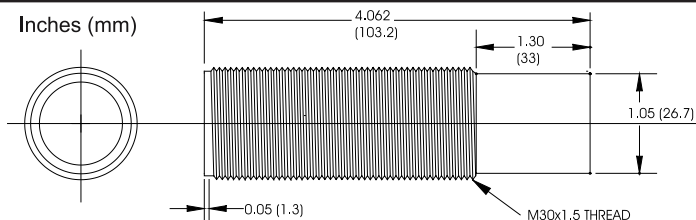
Wiring (6-wire cable)	
Brown	DC+ IN
Blue	GND
Gray	SYNC out or below
Yellow	SYNC in or below
Black	see below
White	see below

MODEL NUMBER	Output #1 (BLACK wire)	Output #2 (WHITE wire)
TS-30S1-IV	4-20 ma. current loop	0-10 / 0-5 VDC
TS-30S1-ISK	4-20 ma current loop	Sinking Switch
TS-30S1-ISR	4-20 ma. current loop	Sourcing Switch
TS-30S1-SKV	Sinking Switch	0-10 / 0-5 VDC *
TS-30S1-SRV	Sourcing Switch	0-10 / 0-5 VDC *
TS-30S1-SKSK	Sinking Switch	Sinking Switch
TS-30S1-SRSR	Sourcing Switch	Sourcing Switch
TS-30S1-SKSR	Sinking Switch	Sourcing Switch
TS-30S1-SK232	Sinking Switch	RS-232 Output (Gray wire)
TS-30S1-SR232	Sourcing Switch	RS-232 Output (Gray wire)
TS-30S1-485	RS-485+ Output (Yellow wire)	RS-485- Output (Gray wire)

Asterisk (\*) indicates selection is user teachable using pushbutton.

Ships with installation instructions and two 30mm SS mounting nuts. Options available.

## Dimensions



### Dimensions

Dimensions are in inches (mm)  
Mounting Hole: 1.2 in. (30.5 mm) diameter

Attached Cable: 6-ft (2 m)  
Total Weight: 12.7 oz (0.36 kg)