



# Tracer 1000™ LTT1

GUIDED WAVE RADAR LEVEL TRANSMITTER



## DESCRIPTION

Featuring TDR (Time Domain Reflectometry) technology, the Tracer 1000™ provides continuous level measurement and point level detection in liquids and solids, with analog and switching output. This innovative device has almost no installation restrictions - it can be mounted in small tanks, tall and narrow nozzles and it measures precisely even with difficult tank geometries or close to interfering structures. Factory settings may be configured via HART® Communication protocol. Tracer 1000 is ideal for various types of processing and storage applications and has an exceptional performance in liquids with low reflectivity such as oils and hydrocarbons.

## FEATURES & BENEFITS

- Revolutionary TDR Technology
- Precise continuous level measurement and reliable point level detection combined in one device
- Highly robust measurement due to 4-wire design and innovative signal analysis and disturbance signal suppression
- Fully modular probe design - Simple to install
- Features HART® Communication protocol
- No Dead Band (for coaxial probe option)
- Economically Priced

## APPLICATION PHOTO

*The Tracer 1000 can be mounted in the most extreme environments with virtually any mounting arrangement.*

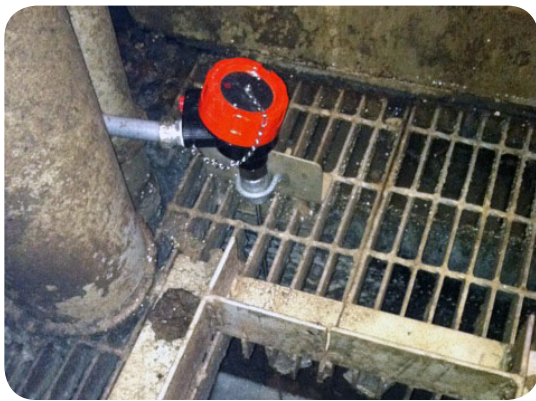


Fig. 1 shows the Tracer 1000 mounted in the corner of a waste sump, through the metal grating, within inches of the discharge piping. No interference from tank obstructions.



Fig. 2 shows the Tracer 1000 mounted in a small vessel where a minimum deadband was required. The Tracer 1000 3/4" NPT process connections was also required along with maximum accuracy and resolution.

## TECHNOLOGY

The Tracer 1000 uses TDR Technology: low-energy, high-frequency electromagnetic impulses, generated by the sensor's circuitry, are propagated along the probe which is submerged in the liquid to be measured. When these impulses hit the surface of the liquid, part of the impulse energy is reflected back up the probe to the circuitry which then calculates the fluid level from the time difference between the impulses sent and the impulses reflected. The sensor can output the analyzed level as a continuous measurement reading through its analog output, or it can convert the values into freely positionable switching output signals. TDR-Sensors are also known as Guided Radars or Guided Wave Radars.

# SPECIFICATION

<b>Electrical Specifications</b>	
<b>Output Functions</b>	The Tracer 1000 is an active, single ended, non-isolated, 3 or 4 wire analog output transmitter.
<b>Analog Output (Active)</b>	Current output 4-20mA: The span between the lower range value [4mA] and the upper range value [20mA] is equal to 0-100% of the continuous level measurement reading as a factory default. Output can be inverted.
<b>Total Load Resistance</b>	< 500Ω: HART resistor approx. 250Ω + load resistance approx. 250Ω if the current output is connected to a device with an inner resistance of approx. 250Ω, then there is no additional external HART resistor necessary. In that case, the HART modem is connected in parallel to the current output wires.
<b>Lower Range Value</b>	4.0mA (span 0%)
<b>Upper Range Span</b>	20.0mA (span 100%)
<b>Response Time</b>	0.5s (default), 2s 5s (selectable)
<b>Temperature Drift</b>	Less than .0078 in/°F change in ambient temperature
<b>Switch Output</b>	DC Switch, PNP, Active, Max. Load 200 mA Current.
<b>Supply Voltage</b>	12-30VDC (reverse-polarity protected)
<b>Current Consumption</b>	< 50mA at 24 VDC (no burden)
<b>Start-Up Time</b>	< 6s
<b>Cable Terminals</b>	Screwless, cage clamp terminal block for stranded and solid wires AWG 22-14.
<b>Measurement Specifications</b>	
<b>Accuracy</b>	± 0.12" or 0.03% of measured distance, whichever is greatest
<b>Repeatability</b>	< .08"
<b>Resolution</b>	< .04"
<b>Probe Type</b>	316 SS Rod: 1/4" Dia. (Coated Rod; 3/8" Dia.) 316 SS Coaxial: 3/8" Dia. Wire Cable: 1/2" Dia.
<b>Probe Length [L]</b>	316 SS Rod: 2.41" - 120" 316 SS Coaxial: 0" - 120" Wire Cable: 2.41" - 480" <i>(Length must be specified when ordering - The reference point is always the sealing surface of the connection thread - See dimensional drawings)</i>
<b>Top Dead Band</b>	0" Coaxial Probe 2.41" Rod or Wire Probe

<b>Measuring Range [M]</b>	Up to 780" depending on probe type
<b>Switching Point [S]</b>	Freely positionable within the measuring range [M] Hysteresis can be set by defining separate upper and lower thresholds; if those are set at the same position, the minimum hysteresis of .11" applies
<b>Application Specifications</b>	
<b>Dielectric Constant [ε<sub>r</sub>]</b>	Wire & Cable Probe: Configurable Coaxial Probe: 0
<b>Conductivity</b>	No restrictions
<b>Density</b>	No restrictions
<b>Standard Application Temp.</b>	F: -40° to 410° C: -40 to 150°
<b>Optional Application Temp.</b>	F: -320° to 500° C: -195 to 260°
<b>Ambient Temperature</b>	F: -13° to 176° C: -25° to 80°
<b>Application Pressure</b>	-14.50 PSI to 580 PSI
<b>Velocity of Level Change</b>	< 3.2 fps
<b>Mechanical Specifications</b>	
<b>Wetted Materials</b>	1.4404 / 316L and PEEK, PTFE
<b>Enclosure Material</b>	Aluminum alloy EN AC-AISI9Cu3 (DIN EN 1706), Epoxy Spray (~70µm)
<b>Enclosure Rating</b>	Standard: NEMA 6 (IP68) Explosion Proof Option: ATEX NEMA 7
<b>Cable Glands/Screw Plugs</b>	1/2" NPT (2) or Cable Glands (2) or 1/2" NPT (1) & Cable Gland (1) or M20 x 1.5 (2) or M20 X 1.5 (1) & Cable Gland (1)
<b>Connection Thread</b>	3/4" NPT (US) or 3/4" G (Metric)
<b>Weight (Less Probe)</b>	1.99 lbs. (903.8 g)
<b>Certification</b>	FM: Class I Groups A,B,C,D Class II Groups E,F,G; Class III; Type 4X Class I, Div. I, AEx D IIC; IP66 Class I, Div. I, Ex d II C

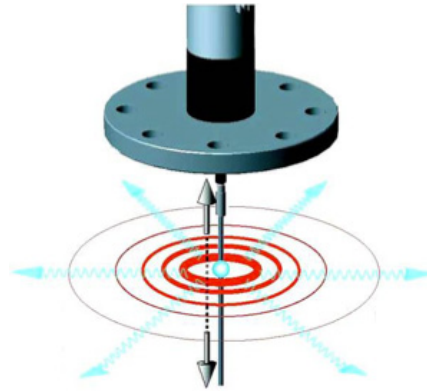
Specifications are subject to change without notice.



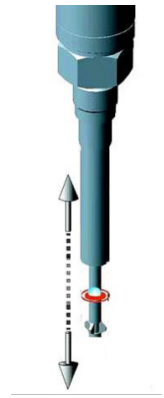
WIRE CABLE PROBE			
316 SS ROD PROBE			
316 SS COAXIAL PROBE			
<b>PROBE MOUNTING</b>			
Tall & narrow nozzles	+	•	•
Difficult tank or nozzle geometries	+	•	•
Close to internal tank structures or tank wall	+	•	•
Probe might move or touch internal tank structures/tank wall	+	•	•
Liquid spray may touch probe above the liquid surface	+	•	•
Non-stationary interface targets, e.g. agitator blades	+	•	•
Measurement readings at the very top or bottom of the tank	+	•	•
Non-metallic tanks	+	•	•
Bypass chambers and stilling wells	•	+	-
Limited headroom for installation	•	•	+
Tall tanks	•	•	+
<b>MEDIA CHARACTERISTICS</b>			
Bulk solids	-	-	+
Measuring low reflectivity liquids (i.e. low dielectric constant)	+	•	•
Viscous, crystallizing, adhesive, coating, or sticky liquids	-	+	+
Fibrous liquids, sludge, slurry, pulp	-	+	+
Liquids containing solid particles	-	+	+
Clean-ability of probe is important	-	+	+

- + = Recommended
- = Possible, maybe with configuration and/or mounting adjustments
- = Not recommended

Cable Probe

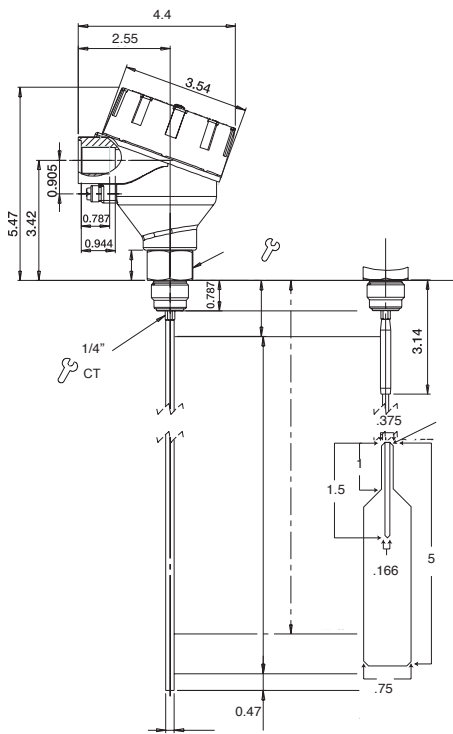
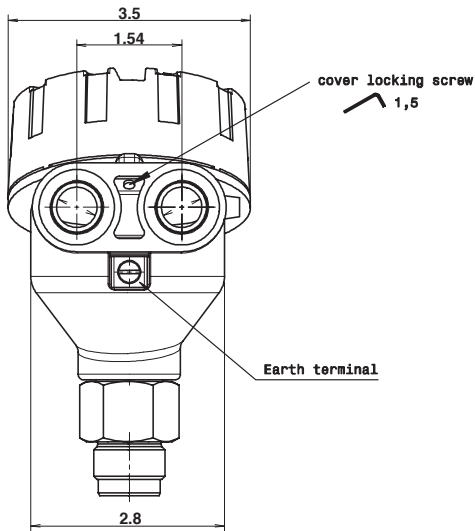


Coaxial Probe

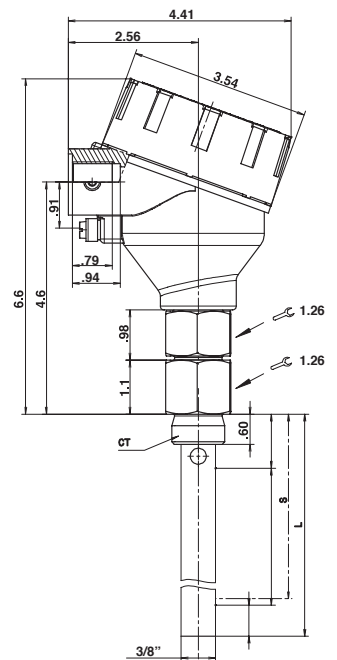


## DIMENSIONS (Inches)

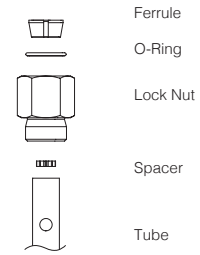
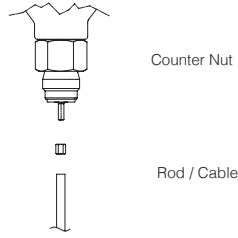
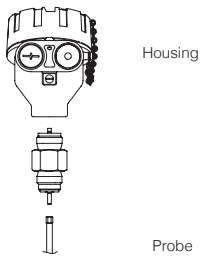
Housing



316 SS Coaxial Probe



## SENSOR COMPONENTS



## COMPLETE LEVEL SYSTEMS & ACCESSORIES



### DigaCom™ 2000 Universal Process Display

is a field mount display that provides bright, 6-digit LED indication, internal DC power supply for transmitter power, 4-20mA repeat output and advanced communications. DigaCom features digital push button configuration, simple programming interface and Ethernet communication. This device is well suited for a variety of process applications. Typical applications include level monitoring, analytical measurements, flow, distance monitoring, pressure monitoring, weight/volume monitoring and temperature monitoring.



### DigaLink™ 3.0 Alarm & Monitoring Software

is FLO-CORP's unique Alarm, Configuration and Monitoring Software. This enables users to receive e-mail alerts, configure, and remotely monitor from the convenience of their PC. DigaLink is unique in its communication protocol that utilizes both TCP/IP Ethernet communication and Modbus/RS485 serial communication simultaneously. This advanced software features e-mail alerts, display configuration, datalogging and real-time monitoring from unlimited devices. With DigaLink you can easily setup, monitor and receive e-mail alerts from practically anywhere.



### eXmod™ Relay Expansion Module

is a 4-relay output module that connects to the display via RS-485 serial communication (4-wire). It is extremely versatile and can be mounted locally or remotely to allow for a purely distributed system. Display(s) can be mounted in the plant or control panel, while the eXmod can be mounted in the motor control cabinet for reduced cost of control wiring. Additionally, the eXmod's BIG 10 AMP AC/DC rated relays bring added value to your control/alarm monitoring systems.

# Ordering Information - Tracer 1000

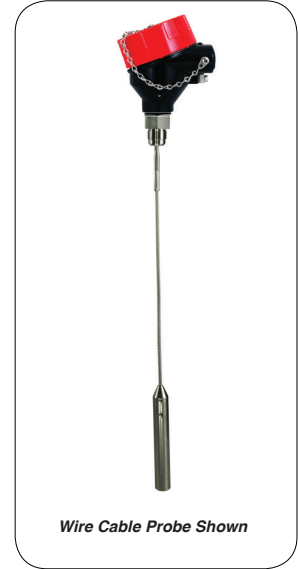
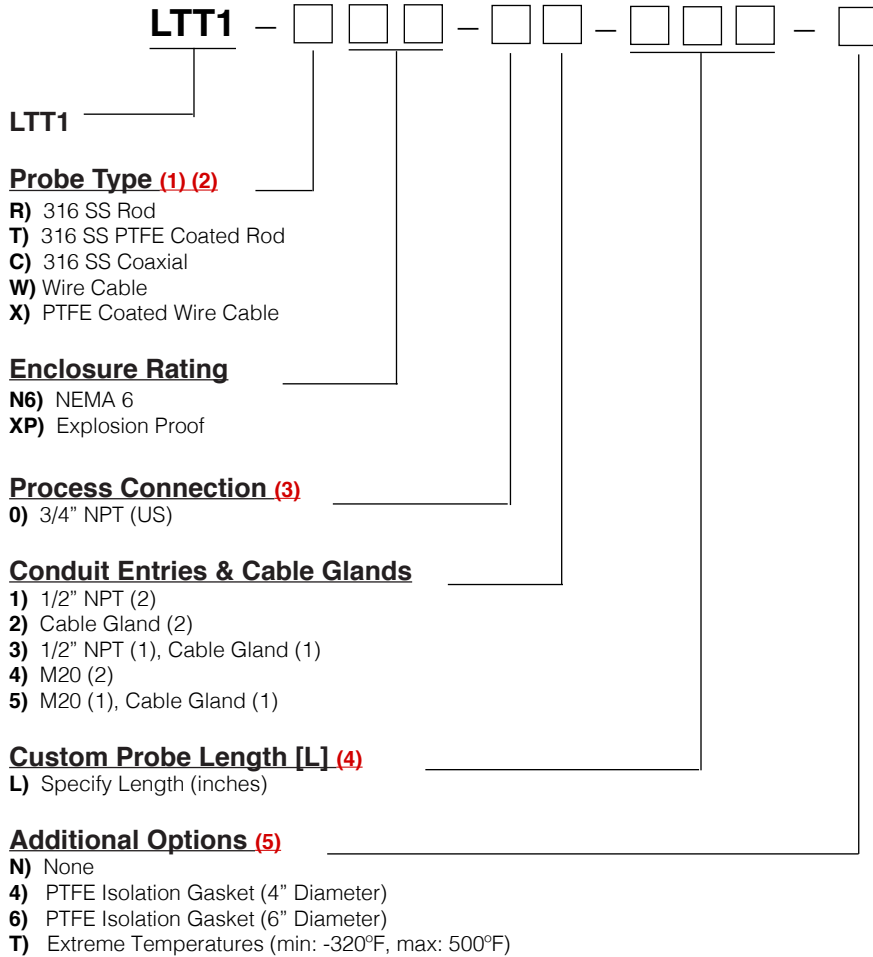
FLO-CORP MODEL NUMBER BUILDER

For Assistance Call 877.356.5463

Use the diagram below, working from left to right to construct your FLO-CORP Model Number.  
Simply match the category number to the corresponding box number.

**Example:** LTT1-RN6-01-120-N-000

*Tracer 1000 GWR Level Transmitter with 316 SS Rod Probe Type, NEMA 6 Enclosure, 3/4" NPT Process Connection, 1/2" NPT Conduit Entries & Cable Glands, 120" Custom Probe Length, No Additional Options.*



**Ordering Notes:**

- (1) Select the best configuration based on your requirements
- (2) Viton O-Ring is supplied with Coaxial probe type. For additional O-Ring materials, please contact factory.
- (3) For special process connections (i.e. flange, size, connection type) please contact factory.
- (4) The L-dimension must be specified in inches (in) and fall within the 'Probe Range' selected.
- (5) Isolation Gaskets are recommended with Probe Type T and X (PTFE Coated Rod & Coated Cable).  
To purchase flanges contact the factory.

*\* Additional probe lengths may be available upon request -  
Please contact factory.*