

LTM IntelliGage™ Series Magnetostrictive Level Transmitters



***LTM-350
IntelliGage™***

Next-Generation Design

Magtech introduces the world's smartest magnetostrictive level transmitter – the LTM-350. The LTM-350 series has a similar look and feel to the second generation model LTM-300, but is packed with many innovative enhancements – from HART 7 to error preventive configuration.

In addition, the LTM-350 features modular electronics and multiple output options, including 4/20 mA, HART 7 and wireless HART. The LTM 350 may be externally mounted to any Magtech LG Series magnetic gauge, or used as a direct insertion level probe. This feature-packed instrument is the perfect solution to many of the industry's most difficult level measurement applications.

FEATURES

- **Dynamic RoC filter**
- **Simple configuration**
- **Auto detect configuration errors**
- **Power optimization software**
- **Factory set threshold – fit and forget**
- **Outputs include 4-20mA, HART 7**
- **LTM-350/250 Series has field-reversible mounting**



Description

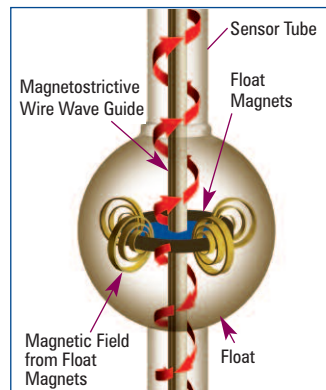
Magtech's LTM Series magnetostrictive level transmitters offer highly accurate and precise liquid level measurement with a variety of configuration options. The LTM may be utilized as a direct insertion transmitter or externally mounted to a magnetic level gauge for non-invasive level control.

The LTM sensor probe with magnetic float(s) is inserted directly into a tank. As the float rises or falls with the fluid, the transmitter provides level output. LTM transmitters are available with two-wire loop powered 4-20 mA signal output and HART.

LTM Series level transmitter operation is based on the principle of magnetostrictive technology. To explain briefly, the sensor consists of an alloy wire with specific magnetic characteristics called the *wave guide*. The wave guide is housed within a stainless steel tube, creating the probe assembly. The transmitter electronically generates a high current pulse which is transmitted down the wave guide, producing a circular magnetic field as it travels down the wire. Another magnetic field is generated on the

wave guide by the permanent magnet in the float along the length of the probe. When the pulse field interferes with the float magnetic field, a torsional force is produced, twisting the wire and producing a torsional wave. The time of flight of the torsional wave is measured and the distance to the float magnet is easily calculated.

Other configurations include remote-mount electronics for easy access or high temperature and vibration applications. Sensor probes are available in a variety of materials including stainless steel and exotic alloys (Monel, Hastelloy, etc.). Sensor probes may also be electropolished for sanitary applications. All LTM transmitters feature explosion-proof, dual compartment enclosures with integral displays.



Magnetostrictive Principle

The "plug-and-play" electronics allow easy upgrades without replacing the sensor probe. LTM transmitters offer the latest and most advanced software features on the market, introducing the only registered HART DD compliant to IEC 61804-2 and compliance certified to HART 7.



INDUSTRIES

- | | |
|------------------|---------------------|
| ■ Marine | ■ Pharmaceutical |
| ■ Coatings | ■ Power Industries |
| ■ Oil and Gas | ■ Food and Beverage |
| ■ Petrochemicals | ■ Water/Wastewater |

APPLICATIONS

- | | |
|----------------------|---------------------------------|
| ■ Position Sensing | ■ Underground Tanks |
| ■ Sanitary Service | ■ Primary Level/Interface |
| ■ Valve Positioning | ■ Process Temperature and Level |
| ■ Inventory Control | |
| ■ Corrosive Process | |
| ■ Batching Processes | |



Redundancy Radar Packages

LTM IntelliGage™ Transmitter Options

HART
REGISTERED

AMS
Suite



LTM 350
(4/20mA)
(HART)

LTM 250
(4/20mA)

Electronic Specifications

Supply Voltage	13 to 36 VDC
Repeatability	.005% of full scale or .010 in., whichever is greater
Non-Linearity	.01% of full scale or .030 in., whichever is greater
Level Sensor Accuracy	.01% of full scale or .030 in., whichever is greater
Analog Output	(1) 4/20 mA primary level
Resolution	.025% of full scale
Output	Primary level, (1) 4/20 mA optional digital outputs via HART for temperature or interface detection
Calibration	Zero and span field adjustable with push buttons, HART and AMS
Advanced Diagnostics	With HART or AMS for troubleshooting
Dampening	1 to 25 seconds (field adjustable via DISPLAY)
Operating Temperature (electronics)	-58 to 185° F (-50°C to 85°C)
Housing	Explosion proof, dual compartment, 1/2-in NPT, epoxy coated aluminum; stainless steel optional
Polarity Protection	Diode in series with the loop
Humidity Limits	SAMA PMC 31.1-5.2
Vibration Limits	SAMA PMC 31.1-5.3
RFI Limits	SAMA PMC 31.1-20 to 1,000 MHz up to 30V/m

Advantages

RoC filter

- Integral filter to suppress noise
- Ignores momentary external noise

Simple 4/20 mA configuration and reranging

- Simply change LRV or URV in units
- No recalibration required

Field-reversible mounting

- Gauge mount units are convertible to bottom mount or top mount with a few simple steps

One point calibration

- Unit may be calibrated by using one reference point; process shutdown not required

Error-proof calibration

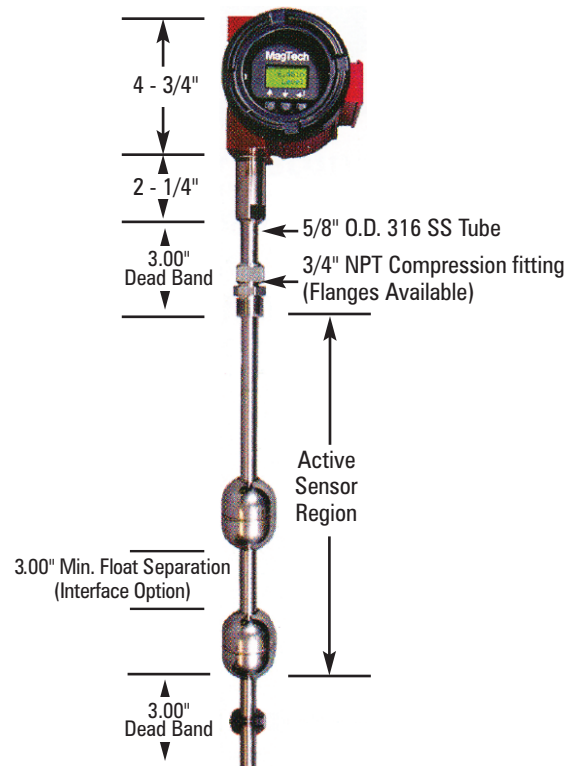
- Auto-detects calibration errors

Factory default settings


- Reverts back to factory settings
- Holds three additional configurations

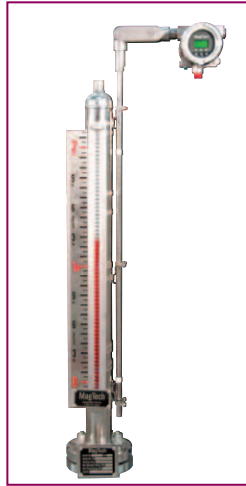
Transmitter Sensor Tube

Material	316 ss standard, optional Hastelloy, Monel, Kynar sleeve
Operating Temperature	Gauge type up to 750° F (399° C) Insertion type -50 to 300° F (-45 to 149° C)
Max. Pressure	2000 psig @ 300° F
Range	12 in. to 30 ft.

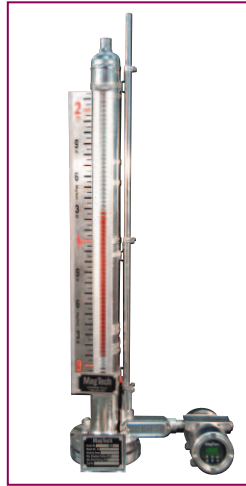


LTM IntelliGage™ Approvals

Approvals	LTM -250	LTM -350
CSA-US EXP 	Class I, Div. I and II; Groups B,C,D Class II, Div. I; Groups E,F,G Class III, NEMA 4X, NEMA 7, IP66	Class I, Div. I and II; Groups B,C,D Class II, Div. I; Groups E,F,G Class III, NEMA 4X, NEMA 7, IP66



*Top-mounted LTM-SST Model
Transmitter on LG Series
Magnetic Gauge*



*Bottom-mounted LTM-SST Model
Transmitter on LG Series
Magnetic Gauge*



*Remote-mounted LTM-SST Model
Transmitter for
High-temperature Applications*

LTM IntelliGage™ Order Information

Insertion Type

Model # (Example): **LTM 350S - 3 - 3 - 0.64 - 150F - 300 - 30.00 - RM10**

250 Single Output Analog, Alum. Housing
251 Single Output Analog, SST Housing
350 HART* (3 Variables), Alum. Housing
351 HART* (3 Variables), SST Housing

Probe Material

3 = 316 SS
K = Kynar Sleeve
O = Other (Specify)

Mounting Connection

3 = 3/4" NPT (Standard)
O = Other (Specify)

Min. Oper. S.G.

Max. Oper. Temp.

(°F or °C)

Max. Oper. Press. (psig)

Measuring Length (in inches, 2 decimal places)

Options

- * Temp = Temp output (Digital)
- * Dual = Dual Level Outputs
- INT = Interface (Specify both S.G.'s)
- SW = Stilling Well
(Specify size; **Required over 10 Ft**)
- 3A = 3A Sanitary Application
- RM = Remote Electronics
(Specify cable length, in ft.)

*Available on LTM 350 HART version only
All units are CSA-US approved standard

Gauge Mount (Gauge dimensions may vary)

Model # (Example): **LTM 250G - 30.00 - RM10**

250 Single Output Analog, Alum. Housing
251 Single Output Analog, SST Housing
350 HART* (3 Variables), Alum. Housing
351 HART* (3 Variables), SST Housing

Measuring Length

Options

RM = Remote Mount Electronics (Specify cable length, in ft.)
(Mounting elbow standard)

All transmitters ≥10 ft are supplied with rigid tube-in-tube design

LTM 300/200D Series Transmitter Options



4/20mA



4/20mA HART



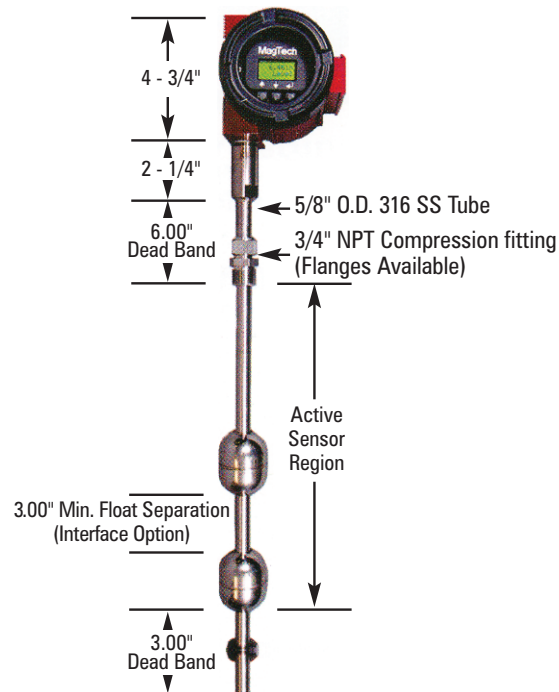
Foundation Fieldbus

Model	LTM200D	LTM300	LTM300FF
Supply Voltage	15 to 36 VDC (loop)	15-36VDC (loop)	Bus powered
Repeatability	0.005% of range or .030 in., whichever is greater		
Non-Linearity	.01% of full scale or .030 in., whichever is greater		
Level Sensor Accuracy	0.01% of range or .030 in., whichever is greater		
Output Options	Single Analog (4-20mA) (Primary or Interface)	Up to 3 outputs Primary, Interface level & temperature (1 analog 4-20mA, 2 digital)	Up to 3 outputs Primary, Interface level & temperature (All digital)
Calibration/Configuration	Pushbutton	HART/pushbutton	Host/pushbutton
Housing:			
Description/Material	Dual compartment, aluminum, epoxy coated enclosure with glass window (optional stainless steel housing)		
Protection Rating	NEMA 4X, NEMA 7, IP 66		
Sensor Probe:			
Material	316 SS, 5/8" probe (standard), other materials available		
Maximum Length	30 ft (914.4 cm)		
Mounting Style	3/4" MNPT compression fitting, Insertion type (flanges available) Non-invasive mount optional		
Operating Temperature	Insertion type -50 to 300° F (-45 to 149° C) Gauge type up to 750° F (399° C)		

*Note: All transmitters feature a standard digital display

Features

- The only Magneto with registered DD's for HART and Foundation Fieldbus to IEC-61804-2
- HART (Rev. 5.0), FF (ITK 4.6), AMS Aware
- Sensor trim from anywhere in the loop with HART
- Measure level, interface and temperature simultaneously
- User-friendly setup via self-prompting menus
- Continuous monitoring of instrument health via HART
- Ideal for high-temperature/high-pressure, corrosive or dirty service



Fieldbus Option

The LTM-300FF is available with Foundation Fieldbus compliant electronics (ITK-4.6), allowing a wide range of interoperability with host manufacturers. There is no PID control in the function block, keeping control in the final control element (pump, valve, etc.) where it belongs. In addition, there is no Link Active Scheduler (LAS), eliminating interference in execution or response time. The LTM-300FF offers a unique configuration method, guiding the user step-by-step through the calibration process. Setup and maintenance are quick and easy. The LTM-300FF is explosion proof and carries CSA, ATEX and IECEx approvals (see LTM Series Transmitter Options) for use in hazardous locations.



LTM Order Information

Insertion Type

Model # (Example): **LTM 300 - 3 - 3 - 0.64 - 150F - 300 - 30.00 - RM10**

200D									
201D, SST Housing									
300									
301, SST Housing									
300FF									
301FF, SST Housing									
Probe Material									
3 = 316 SS									
TFE = Teflon									
KYN = Kynar									
O = Other (Specify)									
Mounting Connection									
3 = 3/4" NPT (Standard)									
O = Other (Specify)									
Min. Oper. S.G.									
Max. Oper. Temp.									
(°F or °C)									
Max. Oper. Press. (psig)									
Measuring Length (in inches, 2 decimal places)									
Options									

- * Temp = Temp output (Digital)
- * Dual = Dual Level Outputs (LTM-300 Only)
- INT = Interface (Specify both S.G.'s)
- SW = Stilling Well
(Specify size; **Required over 10 Ft**)
- 3A = 3A Sanitary Application
- RM = Remote Electronics
(Specify cable length, in ft.)
- A = Atex Approval
- I = IEC Approval

*Available on LTM 300 & LTM 300 FF only
All units are CSA-US approved, standard

Gauge Mount *(Gauge dimensions may vary)*






Model # (Example): **LTM200D - 30.00 - RM10**

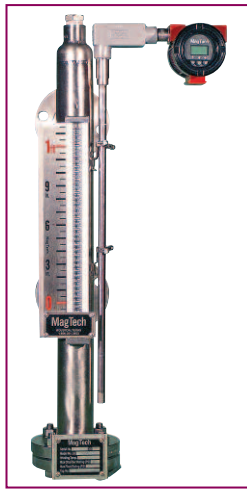
200D			
201D, SST Housing			
300			
301, SST Housing			
300FF			
301FF, SST Housing			
Measuring Length			
Options			

- RM = Remote Mount Electronics (Specify cable length, in ft.)
- A = Atex Approval
- ELB = Elbow mounted electronics
- FM = Factory Mutual

All transmitters ≥10 ft are supplied with rigid tube-in-tube design

LTM 300/200D Description and Approvals

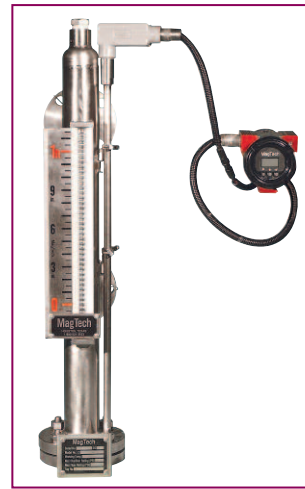
Approvals	LTM-200D	LTM-300	LTM-300FF
FM-Exp 	Class I, Div. I and II; Groups B, C, D Class II, Div. I and II; Groups E, F, G Class III, NEMA 4X, NEMA 7, IP66	Class I, Div. I and II; Groups B, C, D Class II, Div. I and II; Groups E, F, G Class III, NEMA 4X, NEMA 7, IP66	
CSA-US EXP 	Class I, Div. I and II; Groups B, C, D Class II, Div. I and II; Groups E, F, G Class III, NEMA 4X, NEMA 7, IP66	Class I, Div. I and II; Groups B, C, D Class II, Div. I and II; Groups E, F, G Class III, NEMA 4X, NEMA 7, IP66	Class I, Div. I and II; Groups B, C, D Class II, Div. I and II; Groups E, F, G Class III, NEMA 4X, NEMA 7, IP66
CSA-IS	Class I, Div. I and II; Groups C, D	Class I, Div. I and II; Groups C, D	
ATEX-Exp 		 II 2 G EEx d IIC T4	 II 2 G EEx d IIC T4
IECEX-Exp		Ex d IIC T4	Ex d IIC T4



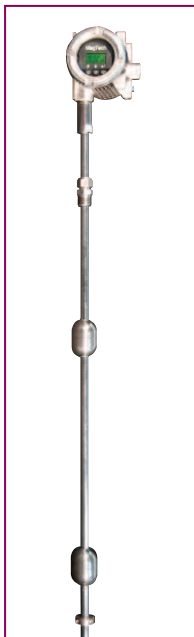
Top-mounted LTM Transmitter on LG Series Magnetic Gauge



Bottom-mounted LTM Transmitter on LG Series Magnetic Gauge



Remote-mounted LTM Transmitter for High-temperature Applications



Stainless Steel Dual Level Transmitter



Stainless Steel Redundancy Package Designed for Severe Offshore Service



Battery Powered Wireless Magnetostrictive Transmitter

Process Indicators & More

LT-6678-4, Quad Alarm

The LT-6678 is a quad relay output alarm system. When the process variable crosses a set point, a SPDT relay is energized and its respective LED located on the front panel is illuminated. Field adjustable set points and Hysteresis are provided.



This quad alarm system can be housed in a NEMA-4X or explosion-proof housing.

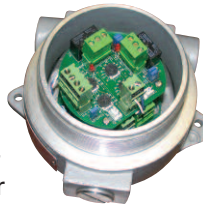
Input: 4/20 mA

Output: 4 relays SPDT

Power: 24VDC or 117/220 Vac

ISE-042 Dual Alarm

The ISE-042 is a general-purpose dual alarm. It can accept inputs from a variety of signal sources, including millivolt, voltage or mA.



The comparator stage has single-turn dial set point adjustments for Alarm 1 and Alarm 2, along with Hysteresis adjustments for each set point.

Output: 2 SPDT 5A relays

Power: 24VDC or 117/220 VAC

ISE-6902A

The 6902A is used as a field mounted local indicator showing the contents of a tank on six bright red, seven-segment LED's. Optional features include HI/LO alarm relays (used for annunciation or level control), isolated mA output, level, volume (requires strapping table) and mass.



Housings: NEMA 4X or explosion proof (NEMA 7).

Power: 117/220 VAC

Wireless Adapters & Gateways

Magtech wireless adapters and gateways provide add-on infrastructure to level transmitters and switches to allow wireless operation. Gateways can be configured to support a variety of Fieldbus protocols, including Wireless HART, Modbus TCP and Profibus DP-V1. Communication from the gateway to the host uses standard ethernet. For remote applications requiring long-range wireless host connectivity, GPRS modem support is available.



Wireless field instrument adapters can be battery operated or line powered. They communicate with the gateway using reliable and secure 2.4GHz mesh-networking protocols and support integration with 4-20mA instruments or intelligent HART instruments. Up to 32 instruments can be supported per gateway.



Wireless Adapter

Magtech is a value-added manufacturer of support instruments for flow, pressure and level processes without manufacturing the process sensors themselves.



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