

Level Plus®

Magnetostrictive Liquid-Level Sensors
with Temposonics® Technology



M-Series Model USTD II

Underground Storage Tank Level Sensing
for Leak Detection and Inventory Monitoring

Document Part Number
550949 Revision E

Product Specification

FEATURES

- DDA Output
- 3-in-1 Measurement
 - Product
 - Interface
 - Temperature
- No Scheduled Maintenance or Recalibration
- Non-linearity 0.025% F.S.
- Intrinsically Safe (I.S.)

APPLICATIONS

- Underground Storage Tanks
- Fuels and Solvents
- Sumps

MARKETS

- Petroleum and Petrochemical
- Biotech and Pharmaceuticals
- Water and Wastewater

Product overview

The Level Plus® Model USTD II level transmitter is designed for use in Underground Storage Tanks (UST). The most common UST application is containing automotive fuels at gas stations. The Model USTD II transmitter provides 3-in-1 measurement using one process opening for product level, interface level, and temperature measurements. Once the transmitter is installed and calibrated, there is no requirement for scheduled maintenance or recalibration. **Set it and forget it!**

The Model USTD II transmitter uses a proprietary ASCII based protocol referred to as Direct Digital Access (DDA) for communication. The DDA output utilizes a 4-wire, multi-drop power and data bus RS-485 network. Utilizing the data bus network eliminates requirements for individual cable runs to and from each tank. The RS-485 network also allows for longer cable runs for more tanks and greater distances.



Level Plus Model USTD II
Liquid-Level Transmitter


All specifications are subject to change. Contact MTS for specifications and engineering drawings that are critical to your application. Drawings contained in this document are for reference only. Go to <http://www.mtssensors.com> for the latest support documentation and related media.

Product specifications

Parameters	Specifications	Parameters	Specifications
LEVEL OUTPUT		CALIBRATION	
Measured variable:	Product level and interface level	Zero adjust range:	Anywhere within the active length
Output signal / Protocol:	DDA	Span adjust range:	Full scale to 152 mm (6 in.) from zero
Order length:	Rigid pipe: 737 mm (29 in.) to 3800 mm (149 in.) §△ § Order length equals the distance from the bottom of the housing to the tip of the pipe, (including the inactive zone). △ Contact factory for longer lengths.	ENVIRONMENTAL	
Non-linearity:	0.025% F.S.	Enclosure rating:	IP 68
Repeatability:	0.001% F.S.	Humidity:	0 to 100% relative humidity, noncondensing
TEMPERATURE OUTPUT		Operating temperatures:	Electronics: -40 °C (-40 °F) to 71 °C (160 °F) Sensing element: -40 °C (-40 °F) to 125 °C (257 °F) Temperature element: -40 °C (-40 °F) to 105 °C (221 °F)
Measured variable:	Average and multipoint temperatures Up to 5	Vessel pressure:	4 bar (60 psi)
Accuracy:	± 0.28 °C (± 0.5 °F)	Materials:	Wetted parts: 316L stainless steel Non wetted parts: 316L stainless steel
ELECTRONICS		FIELD INSTALLATION	
Input voltage:	10.5 to 30.1 Vdc 28 Vdc maximum for I.S. ATEX approval	Housing dimensions:	51 mm (2 in.) dia. by 132 mm (45.2 in.) height
Fail safe:	High, Full scale	Mounting	Rigid pipe: ¾ in. Adjustable NPT fitting or Fill tube hanger
Reverse polarity protection:	Series diode	Wiring	4-wire, plus earth ground
Lightning/Transient protection:	Stage 1: Line-to-ground surge suppression; IEC 61000-4-5 Stage 2: Line-to-line and line-to-ground transient suppressors; IEC 61000-4-4	Electrical Connections	5-pin M12 connector

Agency Approvals

Intrinsically Safe

FM3610	Class I, Division 1, Groups A, B, C and D T4 Division 1, NEMA Type 4X	EN 50020	PTB 04 ATEX 2107X  II 1/2 G bzw. II 2 G EEx ia IIB T4 bzw. EEx ia IIA T4 **
		<i>(Fill tube hanger mount is not ATEX approved)</i>	

MTS DDA Setup software

MTS developed DDA Setup Software designed for Model USTD II applications. The DDA Setup software is customized to assist customers with programming and customizing their installed Model USTD II transmitter. The DDA Setup software allows the user to change addresses, calibrate current tank levels, and create a backup and restore file of current settings. The backup and restore file allows the customer to replace the electronics or transmitter and restore all previously defined settings.

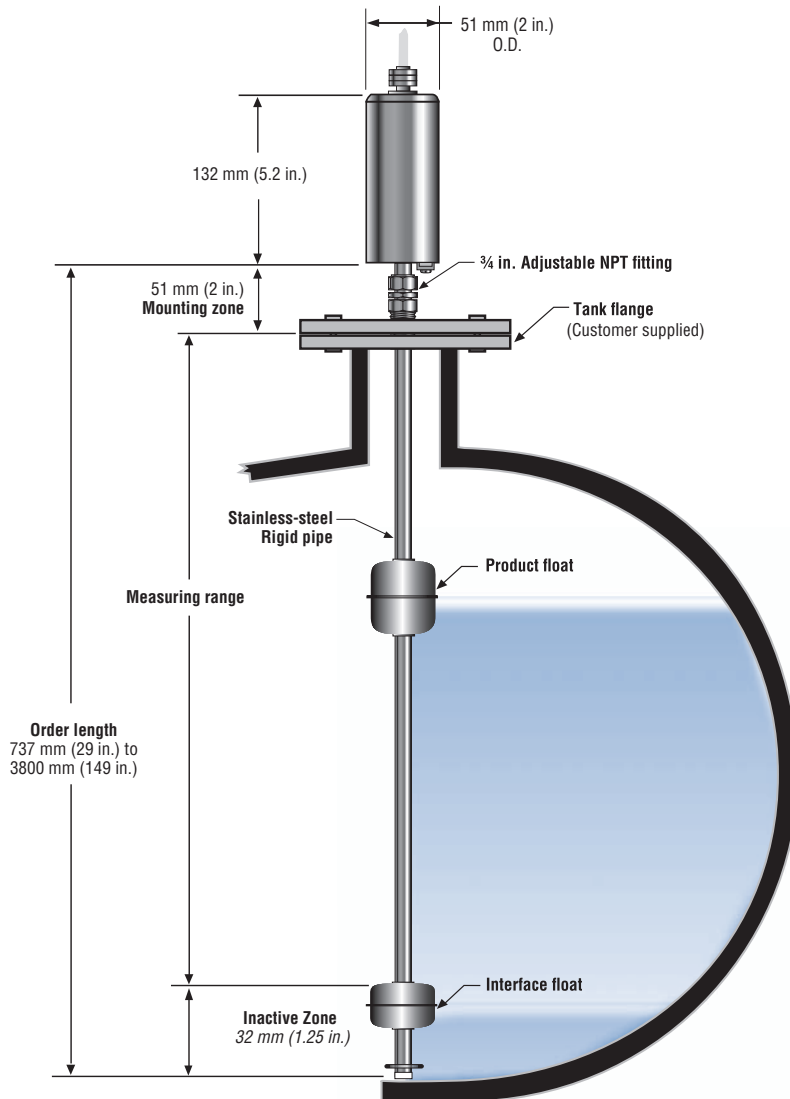
MTS setup software is shipped with each transmitter order. However, if you require an additional copy or an upgrade to your currently installed setup software, updates are available for download from a link on the following MTS Level Products support page.

<http://www.mtssensors.com/support/liquid-level-product-data-sheets-manuals-drawings/index.html>

Product dimensions and mounting

MTS offers the Level Plus Model USTD II transmitter configured with a rigid pipe constructed of 316L stainless steel. The rigid pipe configuration can be ordered in lengths from 737 mm (29 in.) to 3800 mm (149 in.). The Model USTD II can be installed using a flange mount (see illustration below). The flange mount allows the transmitter to be installed external to the tank through a flange with a 3/4 in. NPT Adjustable fitting which is FM, and ATEX approved. The NPT fitting allows the transmitter mount to be adjusted (within an inch) if the tank height and order length are not exactly equal.

The 'Measuring range' of the Model USTD II transmitter is equal to the 'Order length' minus the 'Mounting zone' at 51 mm (2.0 in.) and the 'Inactive zone' of 32 mm (1.25 in.). The Model USTD II transmitter can be ordered with a single product float or can include the optional interface float (Refer to page 7 for float specifications). Average and individual temperature measurement from five positions are included.

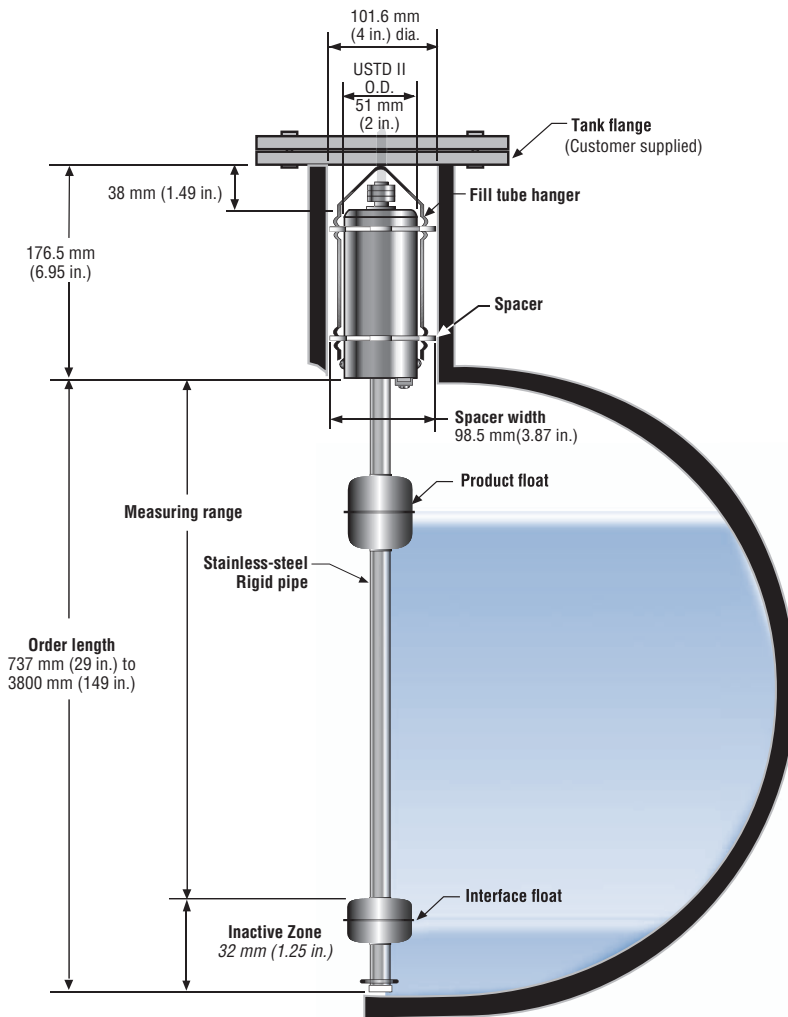


Product dimensions and mounting

MTS offers the Level Plus Model USTD II transmitter configured with a rigid pipe constructed of 316L stainless steel. The rigid pipe configuration can be ordered in lengths from 737 mm (29 in.) to 3800 mm (149 in.). The Model USTD II can be installed using a *Fill Tube Hanger* mount (see illustration below). The fill tube hanger mount allows the transmitter to be installed in the fill tube or riser pipe within the tank and is FM approved.

The 'Measuring range' of the Model USTD II transmitter is equal to the 'Order length' minus the 'Inactive zone' of 32 mm (1.25 in.). The overall length of the transmitter in the tank is equal to the 'Order length' plus the height of the housing and bracket at 176.5 mm (6.95 in.) The Model USTD II transmitter can be ordered with a single product float, or can include the optional interface float (Refer to page 7 for float specifications). Average and individual temperature measurement from five positions are included.

** The Fill Tube Hanger Mount is not available with ATEX Approval



Ordering information

TRANSMITTER MODEL		=	U	S	T	D	I	I	1 - 6
M-Series Model USTD II liquid-level transmitter									
UNIT OF MEASURE		=	<input type="text"/>						7
M	= Metric (millimeters)								
U	= US Customary (inches)								
TRANSMITTER ORDER LENGTH		=	<input type="text"/>						8 - 11
Length	Code								
Millimeters	= LLLL								
Inches	= OLLL								
MOUNTING AND CATEGORY OF APPARATUS		=	<input type="text"/>						12
H	= Fill tube mounting (hanger with centering spacers) FM Approved								
A	= Flange mounting (3/4 in. NPT adjustable fitting) FM Approved								
6	= Flange mounting (3/4 in. NPT adjustable fitting) ATEX Approved								
MOUNTING TYPE		=	<input type="text"/>						13
S	= Standard product without cable (FM Approved)								
9	= Standard product without cable (ATEX Approved)								

STANDARD FEATURES

- Five DT's, evenly spaced
- Data output format (USTD type)


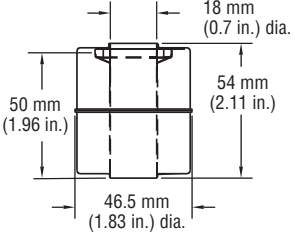
USTD II CABLE ASSEMBLY OPTION


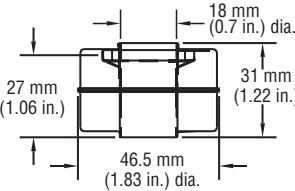
Description	Part number
12 ft. cable assembly	402486


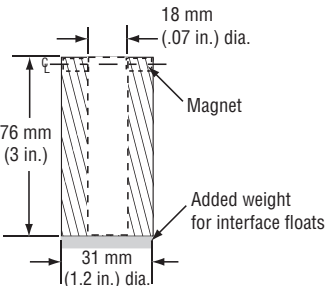
Standard Product and Interface Float Selections

The table below lists standard product and interface float selections. Consult the factory for help in selecting the correct float for your application. For detailed information about all liquid-level product accessories, refer to the 'Level Plus Accessories Catalog, document Number 551103' from a link on the following MTS Level Product Support page:

<http://www.mtssensors.com/products/liquid-level-sensors/accessories/index.html>

PRODUCT FLOAT	Pressure	Temp.	Magnet Offset	Specific Gravity	Material	Weight Offset	Part Number
 	4 bar (60 psi)	149 °C (300 °F)	Yes	0.6	SS	Yes	201605-2

INTERFACE FLOAT	Pressure	Temp.	Magnet Offset	Specific Gravity	Material	Weight Offset	Part Number
 	4 bar (60 psi)	149 °C (300 °F)	Yes	0.85 - 0.9	SS	Yes	201606-2

NITROPHYL PRODUCT / INTERFACE FLOATS	Pressure	Temp.	Magnet Offset	Specific Gravity	Material	Weight Offset	Part Number
 	17.2 bar (250 psi)	104 °C (220 °F)	Yes	0.39	Nitrophenyl	No	201643-1
	17.2 bar (250 psi)	104 °C (220 °F)	Yes	0.80 - 0.86	Nitrophenyl	No	201649-1
	17.2 bar (250 psi)	104 °C (220 °F)	Yes	0.91 - 0.96	Nitrophenyl	No	201650-1



Part Number: 550949 Revision E 05-09

MTS, Temposonics and Level Plus are registered trademarks of MTS Systems Corporation. All other trademarks are the property of their respective owners. All Temposonics sensors are covered by US patent number 5,545,984. Additional patents are pending. Printed in USA. Copyright © 2009 MTS Systems Corporation. All Rights Reserved in all media.



**MTS Systems Corporation
Sensors Division**

3001 Sheldon Drive
Cary, North Carolina
27513, USA
Tel.: +1-800-633-7609
Fax: +1-919-677-2343
+1-800-498-4442
e-mail: sensorsinfo@mts.com
http://www.mtssensors.com

**MTS Sensor Technologie
GmbH & Co. KG**

Auf dem Schüffel 9
D - 58513 Lüdenscheid, Germany
Tel.: +49-2351-9587-0
Fax: +49-2351-56491
e-mail: info@mtssensor.de
http://www.mtssensor.de

**MTS Sensors Technology
Corporation**

737 Aihara-cho, Machida-shi
Tokyo 194-0211, Japan
Tel.: +81-42-775-3838
Fax: +81-42-775-5516
e-mail: info@mtssensor.co.jp
http://www.mtssensor.co.jp