OPERATING INSTRUCTIONS

TRACER 1000 3G™ LTT1-3G
GWR LEVEL TRANSMITTER

Introduction

Please read carefully! No liability can be accepted for damage caused by improper use or installation of the Tracer 3000 Level Transmitter.

The Tracer 1000™ 3G Guided Wave Radar Level Transmitter is ideal for level measurement of liquids, solids, bulk materials, sludge, powders and granules to a distance of 60ft 8 in. Guided-wave technology sends the radar pulse down a probe to measure either liquids or solids. The pulse hits the surface and is reflected back up the probe to the sensor, where the transit time is translated into a distance using time of fight and time expansion. The amplitude of the reflection depends on the dielectric constant of the product. This technology is not affected by pressure, temperature, viscosity, vacuum, foam, dust, changes in dielectric constant or coating of the probe.

⚠ Safety Precautions

If you are unsure of the suitability of a Tracer 1000™ for your installation, please consult your FLO-CORP representative for further information.

NOTE: REMOVE ALL PACKING INSERTS BEFORE OPERATING LEVEL TRANSMITTER.

Authorized Personnel

All operations described in this operating instructions manual must be carried out only by trained specialist personnel authorized by the plant operator. During work on and with the device the required personal protection equipment must always be worn.

Warning about misuse

Inappropriate or incorrect use of the instrument can give rise to application-specific hazards, e.g. vessel over fill or damage to system components through incorrect mounting or adjustment.

General Safety Instructions

The user must take note of the safety instructions in this operating instructions manual , the country specific installation standards as well as all prevailing safety regulations and accident prevention rules. The instrument must only be operated in a technically flawless and reliable condition. The operator is responsible for trouble-free operation of the instrument. During the entire duration of use, the user is obliged to determine the compliance of the required occupational safety measures with the current valid rules and regulations and also take note of new regulations.

Disclaimer

The information contained in this document is subject to change without notice. FLO-CORP makes no representations or warranties with respect to the contents hereof and specifically disclaims any implied warranties of merchantability or fitness for a particular purpose.

FEATURES & BENEFITS

- IECEx Ex ia/d [ia Ga] IIC T6 Ga/Gb Tamb 60°C
- IECEx Ex ia tb [ia Da] IIIC T85C Da Db Tamb 60°C
- Up to 60ft 8in (18.5m) range
- Very short minimum range (6", 150mm)
- Simple Setup
- Auto-calibration to any dielectric ≥ 1.5
- Adjustable Sensitivity
- Precise & continuous measurement
- 2-Wire Loop
- 4-20mA, HART Universal / Common practice commands
- Protection class IP66, NEMA 4X
- Measures extremely low dielectric (1.5)
- Programmable fail safe mode

PRIMARY AREAS OF APPLICATION

- Chemical / Petrochemicals
- Energy
- Food & Beverages
- Plastic Pellets
- Minerals & Mining
- Oil & Gas
- Pharmaceutical
- Pulp & Paper
- Wastewater

TECHNOLOGY

The Tracer 1000™ 3G 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 or solid to be measured. When these impulses hit the surface of the media, part of the impulse energy is reflected back up the probe to the circuitry which then calculates the 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. TDR Sensors are also known as Guided Radars or Guided Wave Radars.

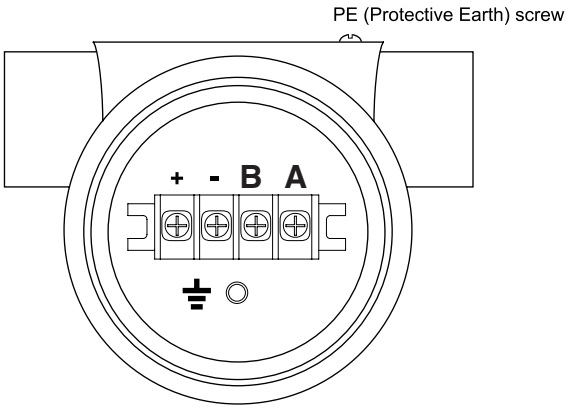
SPECIFICATION

Power	2 wire loop powered 24 VDC (14 to 28 VDC)
Power Consumption	<500mW @ 24 Vdc
Analog Output	• 14V @ 0 Ohm • 19V @ 250 Ohms • 24V @ 500 Ohms • Current park at 4mA, 8mA, 12mA
Communications	HART (Revision 5, Universal & Common Practice commands) Software via HART. Full parameter list
Maximum Range	Flexible cable probe: 60ft 8in Rigid probe: 13ft 1in
Minimum Range	5.9 inches
Dielectric Range	≥ 1.5
Frequency	2.2 GHz
Resolution	Analog: 1uA Display: 1.0mm
Measurements per second	3
Response Time	<1 second (application dependant)
Sum of non linearity, non repeatability, hysteresis	Analog +/- 0.02%

Repeatability	+/- 3mm
Memory	Non-Volatile (No backup battery required) >10 years data retention
Operating Temp.	Standard: -40 to 176ºF (-40ºC to +80ºC) Optional: -40 to 608ºF (-40ºC to 320ºC)
Display	4 line graphic display (128 x 64 pixels)
Language	English
Configuration	4 button (up down, Cal, Run), Software via HART
Approvals	• IECEx Zone 0/1, Zone 1 IECEx TSA 14.0037X Ex ia/d [ia Ga] IIC T6 Ga/Gb Tamb = -40°C to +60°C IP 66, NEMA 4X (T6 … T1) • ATEX Grp II Cat 3 GD IP66 Tamb -40°C to 60°C • IECEx Zone 20/21 IECEx TSA 14.0037X Ex ia tb [ia Da] IIIC T85°C Da Db Tamb = -40°C to +60°C IP 66, NEMA 4X • FM Approvals Pending
Electromagnetic Compatibility	CAN ICES-3(A)/NMB-3(A)

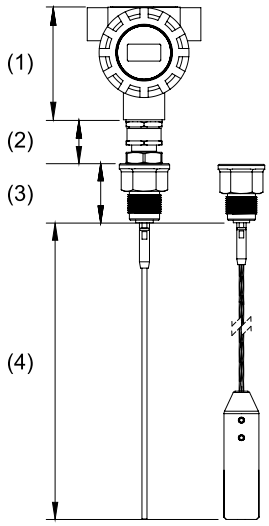
Specifications are subject to change without notice.

WIRING COMPARTMENT



DIMENSIONS

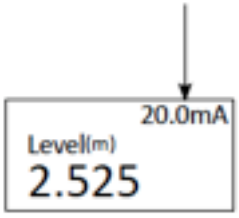
1	Housing
2	Barrier Gland / High Temp extension with Barrier Gland / End position with Barrier Gland
3	Threaded Connection / Flange
4	Probe Length



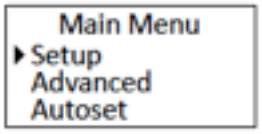
DISPLAYED DIAGNOSTICS

While pressing the arrow buttons, the top corner of the display cycles through various unit diagnostics

DISPLAYED DIAGNOSTICS	
mA	Simulated current output in mA
NORMAL	Unit operating normally
FAILED	Unit in failsafe conditions
RECOVER	Unit searching for level / attempting to amplify signal
LEVEL-1	Upper Material Level Meausrement
LEVEL-2	Lower Material Level Meausrement



SETUP MENU



PARAMETER	DESCRIPTION	OPTIONS
DISPLAY MODE	Select default display mode	Volume[2] Level %Level Distance
DISPLAY UNIT	Adjust displayed measurement unit	Centimeters Metres Feet Inches
LOW LEVEL	Set Low Level (4mA) distance	Adjustable
HI LEVEL	Set High Level (20mA) distance	Adjustable
DAMPING	Adjust output response time & smoothness	Adjustable
TRACKING	Program application Fill and Empty speeds. Fast (90m/h, 265ft/h.) Medium (30m/h, 98ft/h), Slow (10m/h, 32ft/h). InstaTrack is a special mode which we respond immediately to any detected reflection. 'Test' Mode adjusts unit function to be suitable for bench testing and demonstration. The unit will track nearest detected reflection regardless of size.	• Fast • Medium • Slow • InstaTrack • Test
DIELECTRIC	Applies a pre-set value to sensitivity based on selected Dielectric Constant range of material.	• <2 • <2 5 • <10 • <20 • <40 • <80 • > 80

FAIL MODE	Set Failsafe reading	3.80mA >20.20mA LastKnown 4mA 20.00mA >21.50mA
FAIL TIME	Set time delay for FailSafe condition (in seconds)	Adjustable
DIGITIZE	The 'Digitize' function is an automatic setup routine used to eliminate false reflections. See 'Digitze Function' for further information.	• No • Yes • Disable

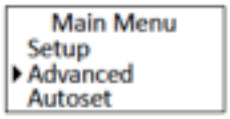
DIGITIZE FUNCTION

The 'Digitize' function is an automatic setup routine to create a digital map of false echoes generated by problems such as non-recommended mounting.

The function should be performed after physical installation to the application.
During the process the unit will prompt a measured distance (this must be either the material level if material is touching the probe, or end of probe of the vessel is empty. For Interface model type it must be the Upper Layer). The distance is adjustable if the displayed distance is not correct.
Ensure the value is not greater than the distance to the material level.

For best results follow this routine:
1) Ensure the unit is mounted according to mounting specifications and requirements.
2) Ensure the material to be measured is in contact with the actively measured part of the probe.
3) Select Dielectric pre-set value of most similar to material to be measured. For Interface model type it must be the Upper Layer).
4) Run Digitize routine. Confirm displayed distance is either material level.

ADVANCED MENU



PARAMETER	DESCRIPTION	OPTIONS
COMMS	Adjust communication protocol settings. The default ID is 0, and the default baud rate is 1200	• Device ID • Baud Rate
SENSITIVITY	Manual adjustment of Sensitivity. Dieletric selection automatically sets this value to defaults based on the Dieletric selection. Sensitivity is the primary adjustment for the unit's ability to detect media. A higher value is used for lower Dk materials or more difficult applications	• 0-100
BLANKING	Blanking is a non-measurable zone. This can be increased to 'Blank' out high level false echoes caused by mounting	Adjustable <150mm (6") is not recommended

ANALOG	Adjust Analog output. Switch from 4-20mA to 20-4mA Fine tune both 4mA current and 20mA current reading Park (Lock) Current to 4, 8 or 12mA.	• 4-20 • 20-4 • 4mA tuning • 20mA tuning • Park 4mA • Park 8mA • Park 12mA
INTERFACE(1)	Enable / Disable Interface measurement mode. See 'Interface Mode' for more information	Enable / Disable
FACTORY RESET	Restore all parameters to factory default.	• Yes • No
DEVICE INFO	Display device information	• <2 • <2 5 • <10 • <20 • <40 • <80 • > 80
LOCK CODE	Enable / Disable lock code. If enabled, select lock code number.	Enable / Disable
PROBECALIBR	If physical length of probe is adjusted you must run this routine for the system to re-detect the probe end. Nothing should be touching the probe when commencing this function.	• Adjustable • Password protected (222)
PROBEFAULT	Probe Fault will activate Failsafe in the event of a missing Probe	Enable / Disable
DIST CALIBR	Calibrate distance correction factor. Some applications or environments can affect time of flight signal travel affecting the measured distance reading. This function allows the detected distance to be adjusted to suit the application.	Adjustable

(1)Interface mode is only available with the Interface communications option (see Part Numbers)

INTERFACE MODE SETUP

Interface mode is only avaialble with the Interface communications option (see Part Numbers).
The Interface mode is designed to measure applications with low to high dielectric constant layers.
The transmited signal relfects off the Upper Layer and continues through the Interface and reflects from the Lower Layer.

The unit provides a level reading for both the Upper and Lower Layers available via HART. The Lower Layer will always be transmitted to the 4-20mA output.

When Interface mode is Enabled, the following parameters are adjustable.

PARAMETER	DESCRIPTION	OPTIONS
DK COMP	Set dielectric of interface layer. This adjusts the velocity compensation for the transmitted signal as it passes through the interface. Default 2.22	0-100

IFACE WIDTH	Set water reading (level 2) offset in the event of a merged echo. A merged echo will occur if the interface is too thin to produce a separate echo. The offset is measured from the end of the merged echo backwards. Default 150mm (0.5ft) Note: This is an advanced setting and should not be adjusted without expert knowledge	Adjustable
IFACE SIZE	Sets the echo size (in signal voltage) to dictate whether an echo is from the Interface or Level. If the echo is larger than the value the unit will assume no Interface is present and will set Level 1 reading to be the same as Level 2 reading. If the echo is smaller it will assume there is only an Interface layer measurable and will set Level 2 to end of probe measurement. Default 2.34 Note: This is an advanced setting and should not be adjusted without expert knowledge	0-2.49

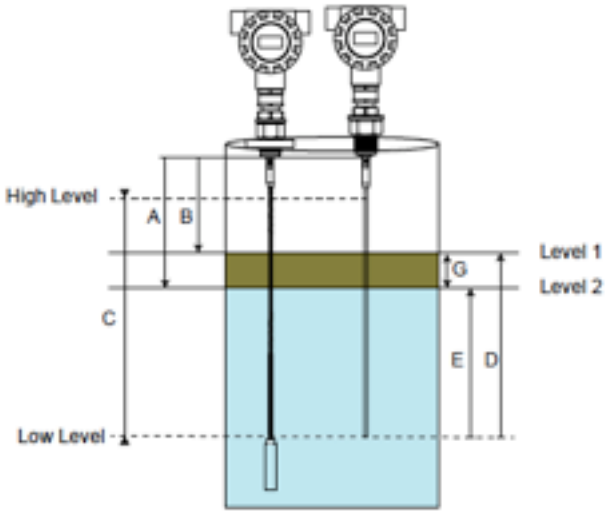
COMMISSIONING

PARAMETER	INSTRUCTION
1. SET INTERFACE MODE	If the application is NOT an interface application, disable interface mode.
2. SET HIGH AND LOW LEVEL	High and Low level distances can be programmed manually or you can run Autoset. Autoset can be used to program the High or Low level based on the material level which is touching the probe when the function is run.
3. SET TRACKING SPEEDS	Tracking speeds can be set to Fast, Medium, Slow and Custom (measured in Displayed Units per hour)
4. SELECT DIELECTRIC	Choose closest Dielectric range of Upper material Level from the pre-set list. Select lower value if unsure. <2 will be appropriate for most Interface applications.
5. RUN DIGITIZE	Confirm displayed distance is either material level (for Interface applications it must be the Upper Layer) or end of probe if vessel is empty. Ensure the value is not greater than the distance to the material level. See 'Digitize Function' for additional critical information.
6. SET DK COMPENSATION	Program Dielectric value of Upper Material Layer in Interface Menu
7. ADD DAMPING	Increasing Damping value if a smoother response trend is required. This value is automatically set by the Tracking speed.
8. RUN UNIT	Press RUN several times to commence unit operation

REGISTERS

ADDRESS	VARIABLE / DESCRIPTION	CONVERSION TO FEET	MEASUREMENT REFERENCE
720	Primary Variable (Level 2 Level in mm)	Div. by 304.7851	E
721	Secondary Variable (Level 1 Level in mm)	Div. by 304.7851	D
722	Tertiary Variable (interface Height in mm)	Div. by 304.7851	G
723	Low Level (mm)	Div. by 304.7851	
724	High Level (mm)	Div. by 304.7851	
725	Primary Variable Status		
726	Primary Variable (Level 2 Distance in mm)	Div. by 304.7851	A
727	Primary Variable Percentage		C
728	Secondary Status		
729	Secondary Variable (Level 1 Distance in mm)	Div. by 304.7851	
730	Secondary Variable Percentage		C

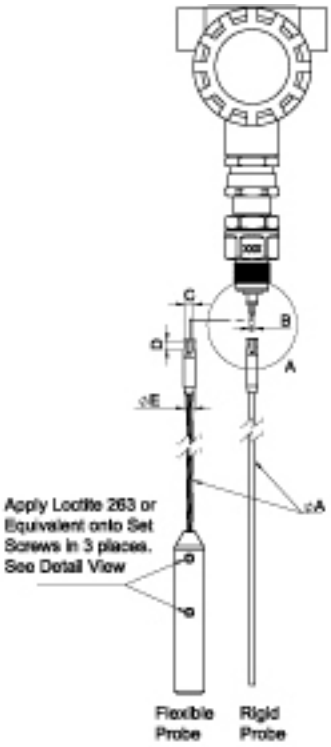
MEASUREMENT REFERENCE

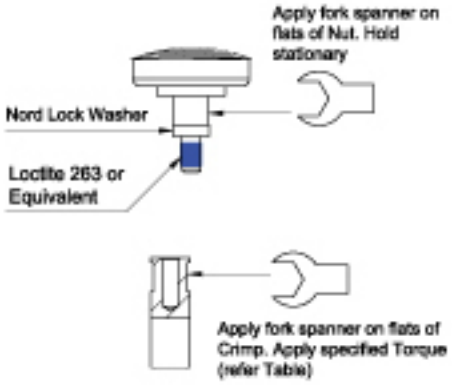


STATUS BIT MAPPING

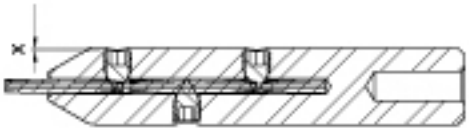
Bit	Description
4	Confirmed Status (Unit tracking valid echo)
F	Failed (unit in failsafe condition) Primary Variable only

Instructions for Assembling Detached Probe Handling and Mounting:





Rope Weight

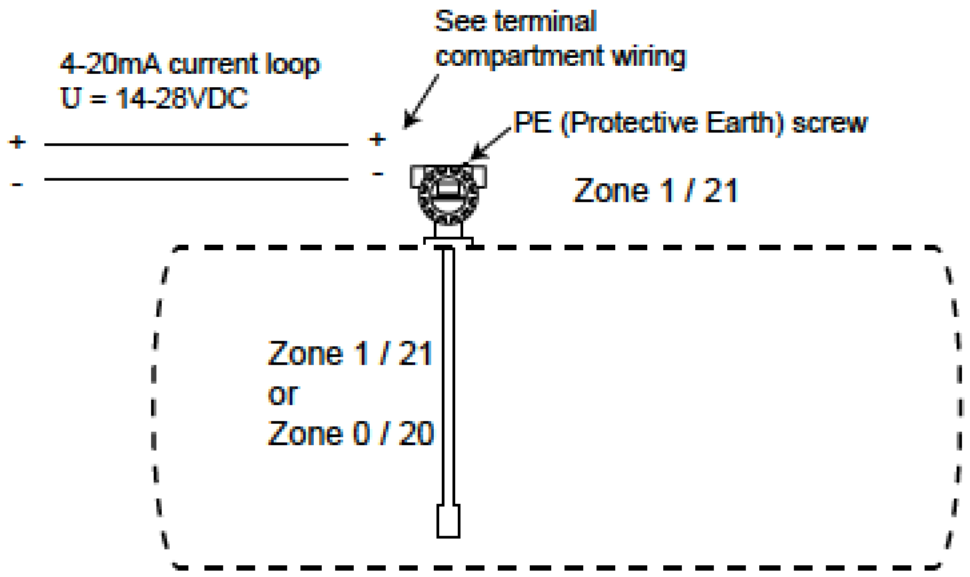


Note: Only Probes supplied by FLO-CORP can be fitted in situ. Mounting of any other probe voids Hazardous Location Approval

Probe	Ø A(mm)	B(mm)	C(mm)	D(mm)	Ø E(mm)	T. Torque
J04, K04	4	M4	7	6	8	5 Nm
J06, K06	6	M6	10	6	11	10 Nm
J08, K08	8	M10	15	10	16	20 Nm

Set Screws on Rope Weight				
Probe	**Set Screw**	**Length**	**X**	**Torque**
J04, K04	3XM8X1.25	12mm	1mm	20 Nm
J06, K06	3XM8X1.25	12mm	3mm	20 Nm
J08, K08	3XM10X1.5	18mm	3mm	20 Nm

Wiring in Hazardous Locations



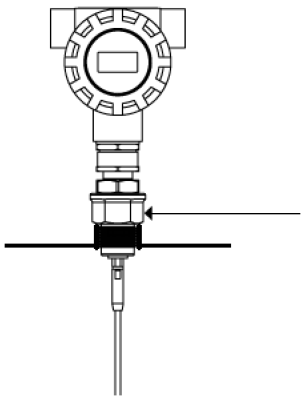
NOTE: (Ref Safety Instructions Sect 10a)

Application of supply voltages above 28VDC will cause damage to the equipment.

Voltages less than the U_m will not invalidate the type of protection.

Mounting - Instruction for Rotating the Housing

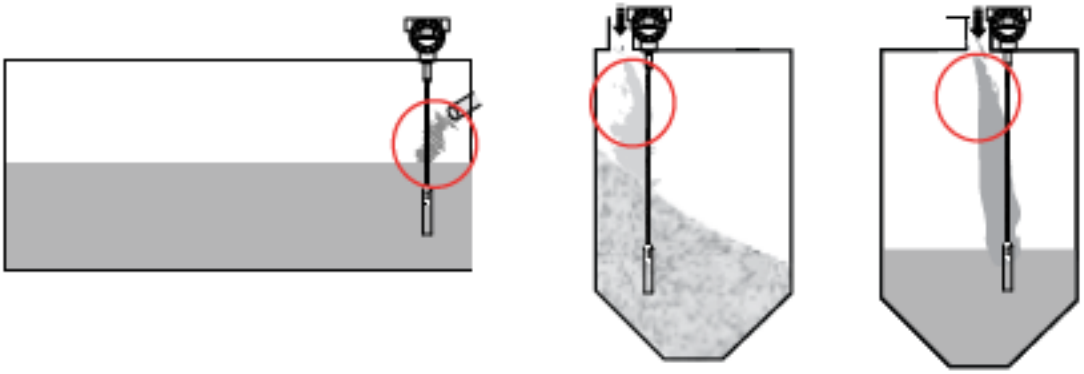
- There are specific rotation points which should be used while mounting the unit into place.
- The Housing Compartment should never be used to rotate the device during mounting.
- For rotating the housing after installation see 'Rotating the Enclosure' section.



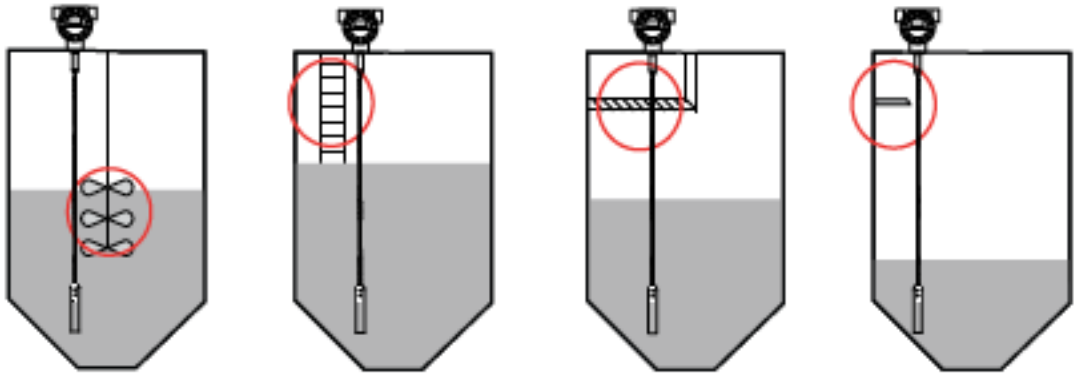
When Installing the Tracer 3000 unit, use spanner or wrench ONLY at Process Fitting as indicated.

Placement Requirements

Do NOT mount near infeed

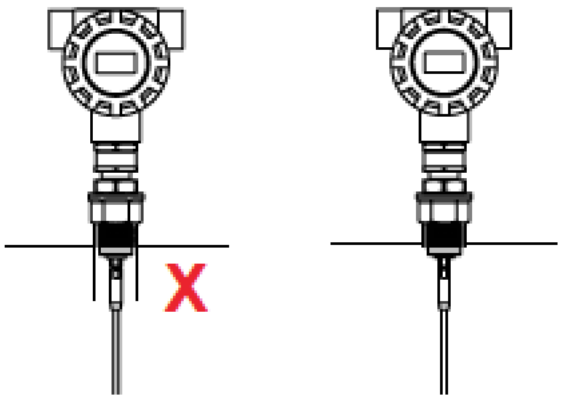


Do NOT mount over or adjacent to any obstacles



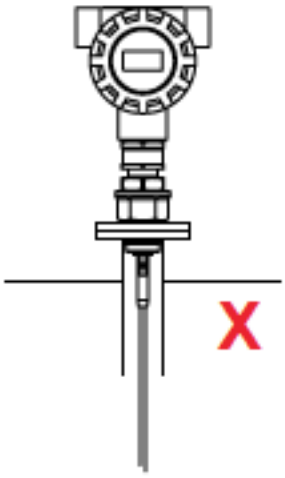
Nozzle / Socket Mounting

Nozzle / Socket should not protrude into vessel

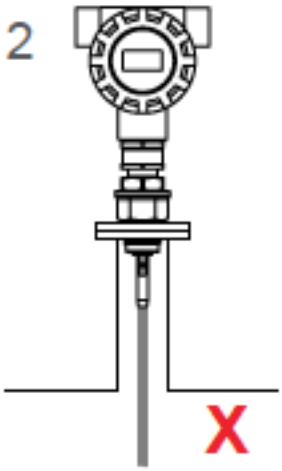


Stand Pipe / Flanged Mounting

1



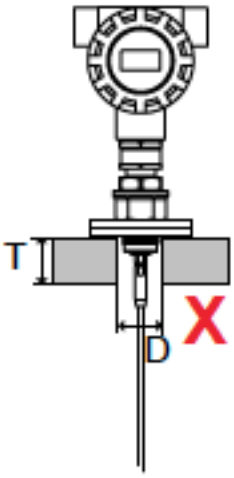
2



1. Stand pipes protruding into vessel may cause signal interference. Digitisation and / or Blanking Distance must be adjusted to avoid measurement issues

2. Long / narrow stand pipes may cause signal interference. Digitisation and / or Blanking Distance must be adjusted to avoid measurement issues

3



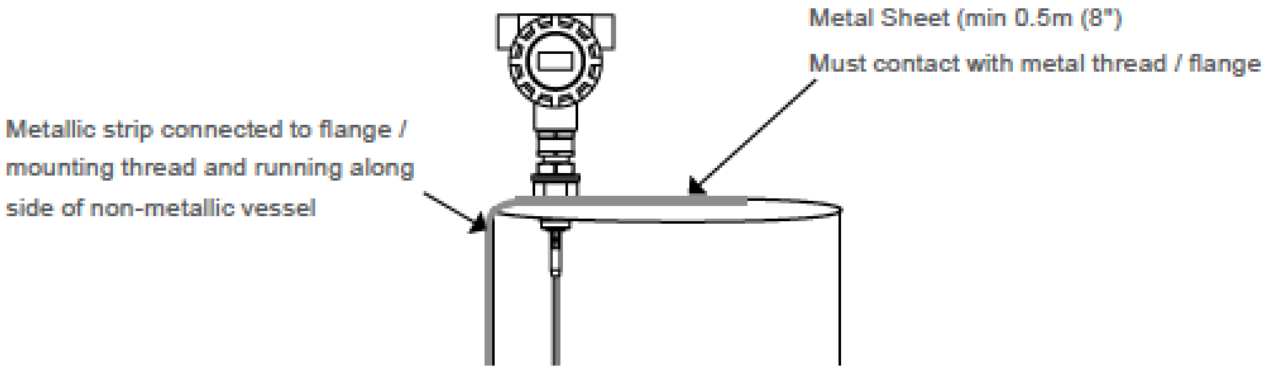
3. Roof Thickness (T) should not exceed Diameter (D) of cut away. Digitisation and / or Blanking Distance must be adjusted to avoid measurement issues

Mounting - Conductive Vessel

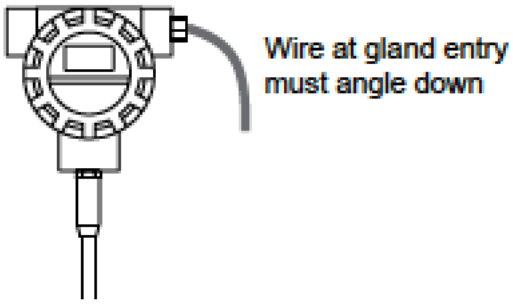
Unit performance is most optimized when there is a ground reference between the mounting (metal flange or thread) and the vessel. Metallic or metal reinforced vessels are ideal.

Mounting - Non Conductive Vessel

A non conductive vessel will require a conductive metal strip or equivalent connected to the metal flange or thread and running along side the vessel for at least the Probe insertion length. A conductive metal sheet (min 0.5m (8") should also be mounted on the roof and be in contact with metal thread or flange. If a seal / gasket is used between the flange and the vessel ensure non coated / painted bolts are used to create ground reference with vessel.

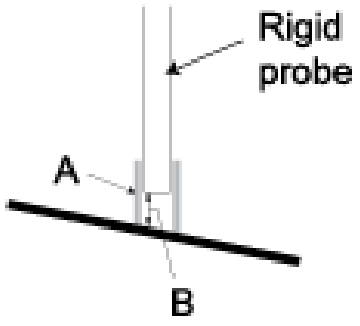


Gland Entry Wiring

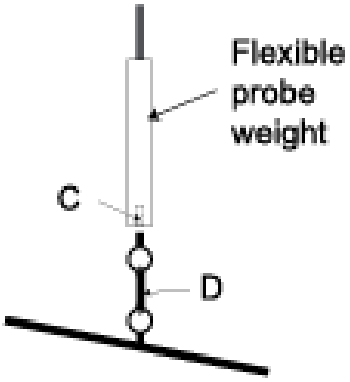


Securing The End of The Probe

- Securing the end of rigid probes is not required unless there is risk of excessive lateral forces.
- Securing flexible cable weight via M10 thread on base of weight is recommended to prevent movement.



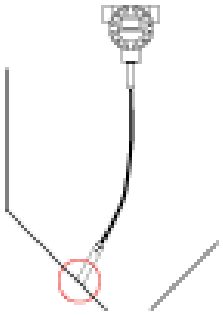
A	Metal socket
B	Floor clearance (min 50mm, 2")

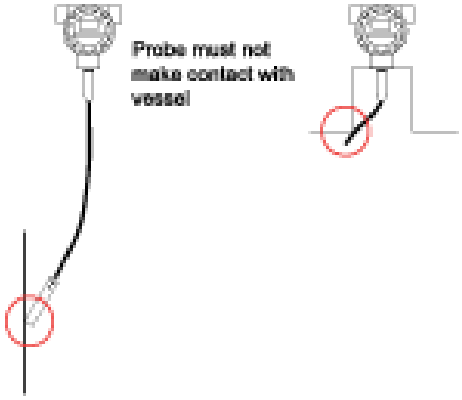


C	M10 thread
D	Cable Weight Fastening Kit or appropriate O ring & link secured to vessel floor.

Flexible Probe Movement

- Avoid mounting adjacent to internal structures (eg ladders, walkways). The cable must not make contact with any part of the vessel
- Take into consideration that material forces may push probe laterally. Secure Cable Weight if required.





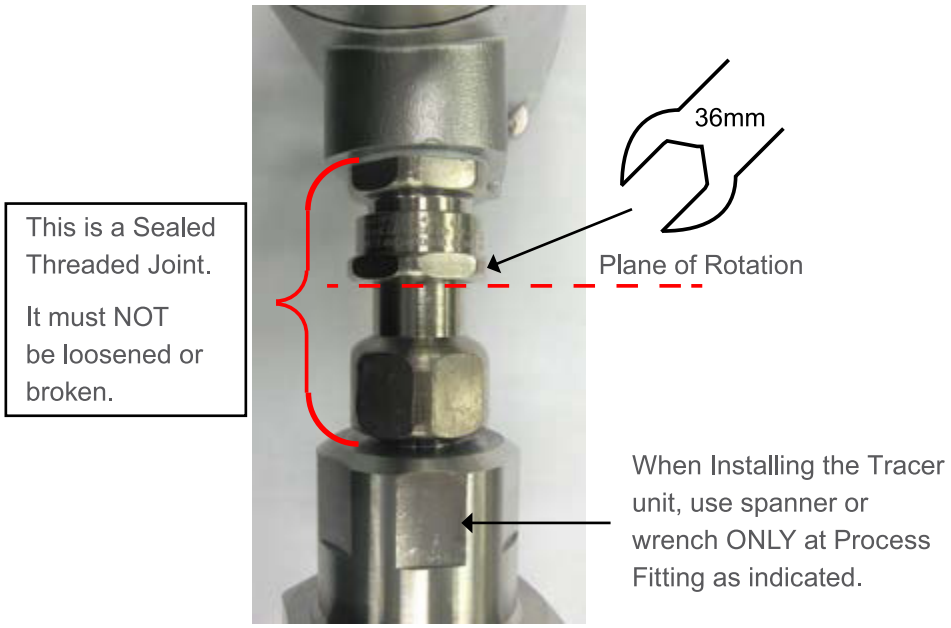
Adjusting Probe Length

Rigid Probes
Cut rigid probes to appropriate length. After adjustment, you must change the 'ProbeLength' Parameter in 'Advanced' menu to represent the new length (password 222).

Flexible Probes
(a) Mark the point at which the flexible cable enters the cable weight.
(b) Release the cable weight grub screws with hex key.
(c) Measure and note the length of cable concealed within cable weight.
(d) Cut cable noting the length of cable must include the concealed length above.
(e) Re-insert the cable into the weight and tighten grub screws to tightening Torque of 20Nm. Use loctite 243 or equivalent on grub screws to secure once completed.
(f) Adjust ProbeCalibr Parameter in 'Advanced' menu to represent new length (password 222).

Rotating Ex Rated Enclosures

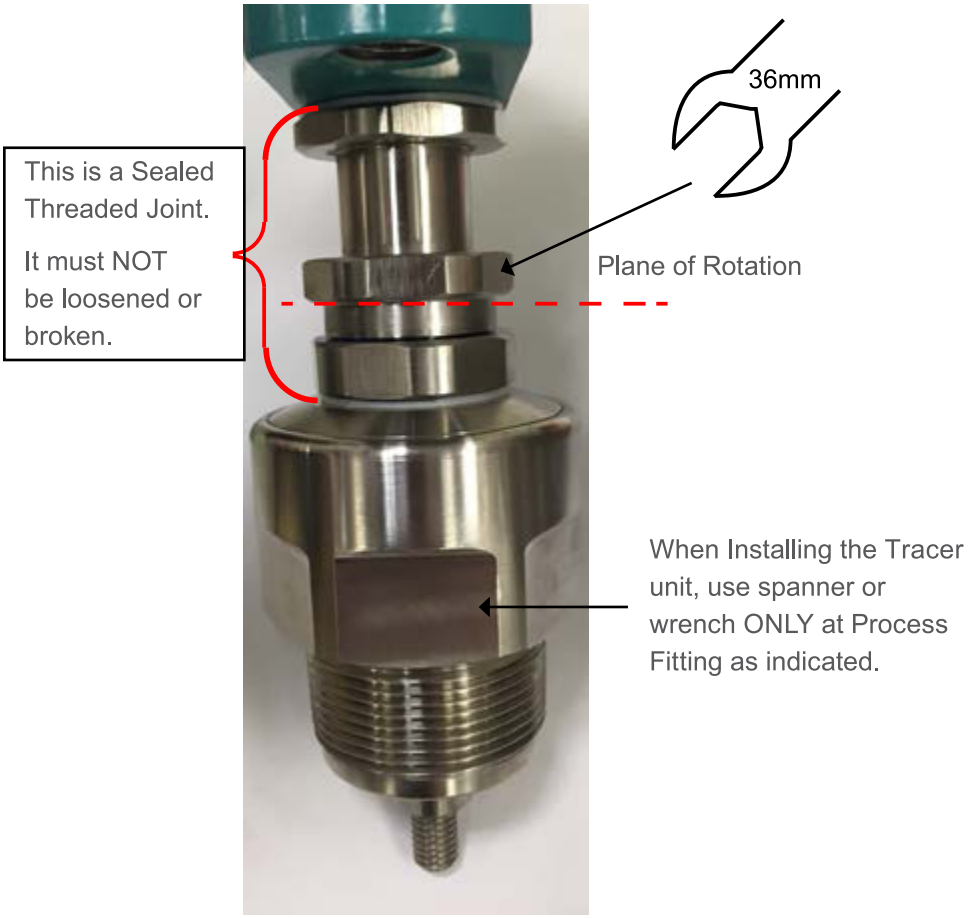
The Ex d gland which couples the sensing probe to the flameproof enclosure provides a critical sealing function for the enclosure. Internal wires are passed through this gland and the high integrity seal. This gland
incorporates a Union Joint which is designed to rotate.
However, this rotation is limited to one-time adjustment of Display orientation after installation on site.
ONLY one 36mm spanner applied to the Hex of Union Joint to rotate enclosure to desired orientation as allowed. DO NOT hold the enclosure during this procedure.
Rotation beyond these strict limits can damage the internal cables
Ensure Enclosure follows the spanner rotation and assembly integrity is not compromised



Rotating non Ex Rated Enclosures

The gland which couples the sensing probe to the enclosure provides a critical sealing function for the enclosure. Internal wires are passed through this gland and the high integrity seal. This gland incorporates a Union Joint which is designed to rotate.

However, this rotation is limited to one-time adjustment of Display orientation after installation on site.
ONLY one 36mm spanner applied to the Hex of Union Joint to rotate enclosure to desired orientation as allowed. DO NOT hold the enclosure during this procedure.
Rotation beyond these strict limits can damage the internal cables
Ensure Enclosure follows the spanner rotation and assembly integrity is not compromised



Forces On The Probe

Tensile forces are heavily dependent on the viscosity and abrasive characteristics of the product in the vessel. Ensure tensile loading is appropriate for the selected cable as well as the silo cover and mounting structure. In critical cases it is better to select the larger flexible cable (8mm).

Probe Type	Tensile Load
A04 / J04 (4mm flexible cable @ 20°C, 68°F)	0.5 Ton
A06 / J06 (6mm flexible cable @ 20°C, 68°F)	1.0 Ton
A08 / J08 (8mm flexible cable @ 20°C, 68°F)	4.0 Ton

Lateral forces can exist due to movement and gradual flow of the product in the vessel, particularly with powder and granular materials.

These forces can cause stress and strain on the probe, as well as the process fitting and mounting hardware. Ensure that lateral forces are minimized by following the installation guidelines and Placement Requirements.

Probe Type	Lateral Load
B04 / K04 (4mm rigid probe @ 20°C)	1 Nm
B06 / K06 (6mm rigid probe @ 20°C)	3 Nm
B08 / K08 (8mm rigid probe @ 20°C)	8 Nm

Installation should only be performed by suitably qualified personnel.

A. Confirm mounting is within recommended specifications.
B. Check the selected unit matches the required application specifications.
For Hazardous Locations see appropriate safety instructions available at http://www.FLO-CORP.com
C. Check the wiring is correct and all connections are secure.
D. Apply power to the unit.

When power is applied the unit will start its normal load sequence.
The following messages will cycle on the display.

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The following messages will cycle on the display.
FLO-CORP
Tracer 3000 Series
Serial Number
Software Revision

Menu Navigation

1 Navigate up, increase value

2 Navigate down, decrease value

3 CAL Proceed, select, save

4 RUN Go back, return unit to operational mode

HART Information / DD

HART Revision 7

DD files available at www.flowlineoptions.com/software in 'Drivers' section.

Supported hosts are PRM, Fieldmate and AMS. The DD file uses 'DTM Works' when installed to convert the DD to a Built-in HART DTM. There is also DD files for the 475 Communicator.

HART Universal Command List

Revision 7

Universal Commands

Command No.	Function
0	Read unique identifier
1	Read Primary Variable
2	Read current and percent of range
3	Read current and four predefined dynamic variables.
6	Write polling addr
7	Read loop configuration
8	Read Dynamic Variable Classifications
11	Read unique ident. Associated with tag
12	Read message
13	Read Tag, Description, Date
14	Read PV sensor information
15	Read output information
16	Read final assembly number
17	Write message
18	Write Tag, Description, Date
19	Write final assembly number
20	Read Long Tag

HART Common Practice List

Revision 7

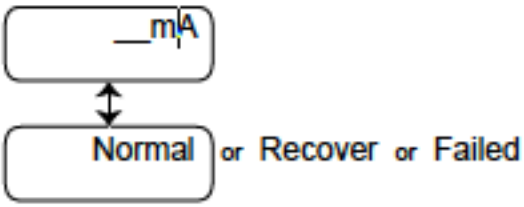
Common Practice Commands

Command No.	Function
34	Write Primary Variable Damping Value
35	Write Primary Variable Range Value
36	Set Primary Variable Upper Range Value
37	Set Primary Variable Lower Range Value
38	Reset Configuration Changed Flag
40	Enter/Exit Fixed Primary Variable Current Mode
44	Write Primary Variable Units
45	Trim Primary Variable Current Dac Zero
46	Trim Primary Variable Current Dac Gain
57	Read Unit Tag, Descriptor, Date
58	Write Unit Tag, Descriptor, Date
59	Write Number Of Response Preambles
109	Burst Mode Control
110	Read All Dynamic Variables

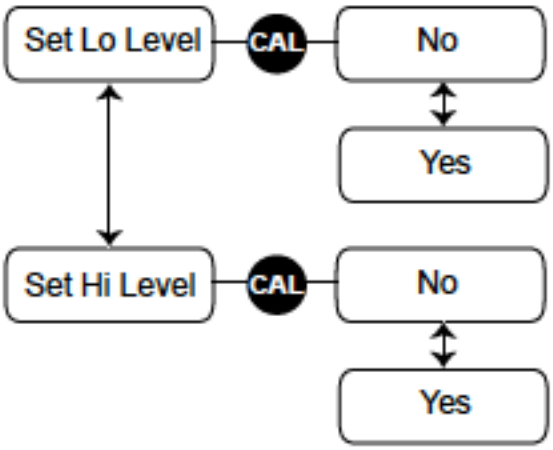
Status / Diagnostic Flags

Status / Diagnostic Flags
Device Malfunction (Fails safe status)
Configuration Changed
Cold Start
Output Current Fixed
Primary Variable Out of limits

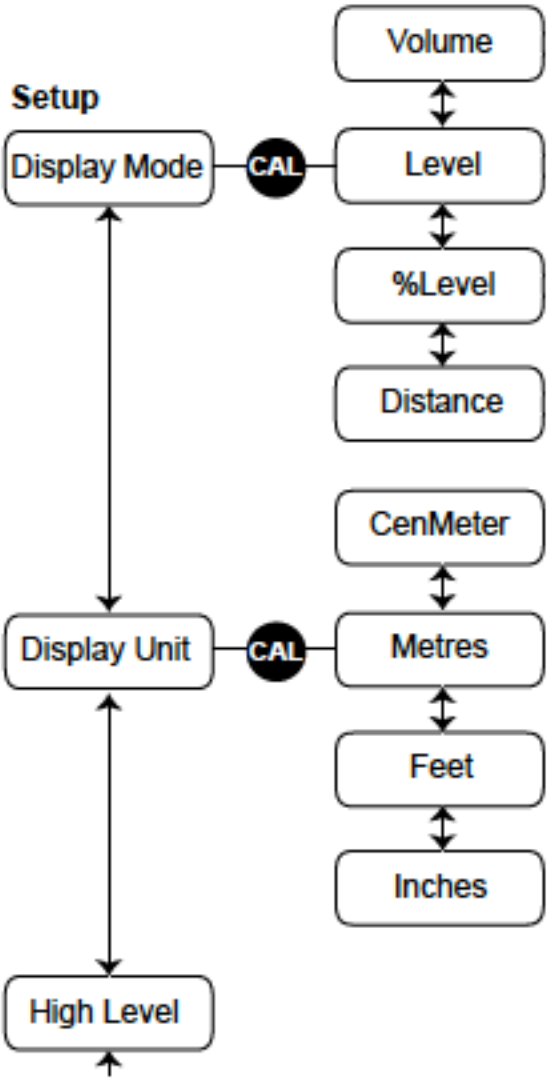
Diagnostics

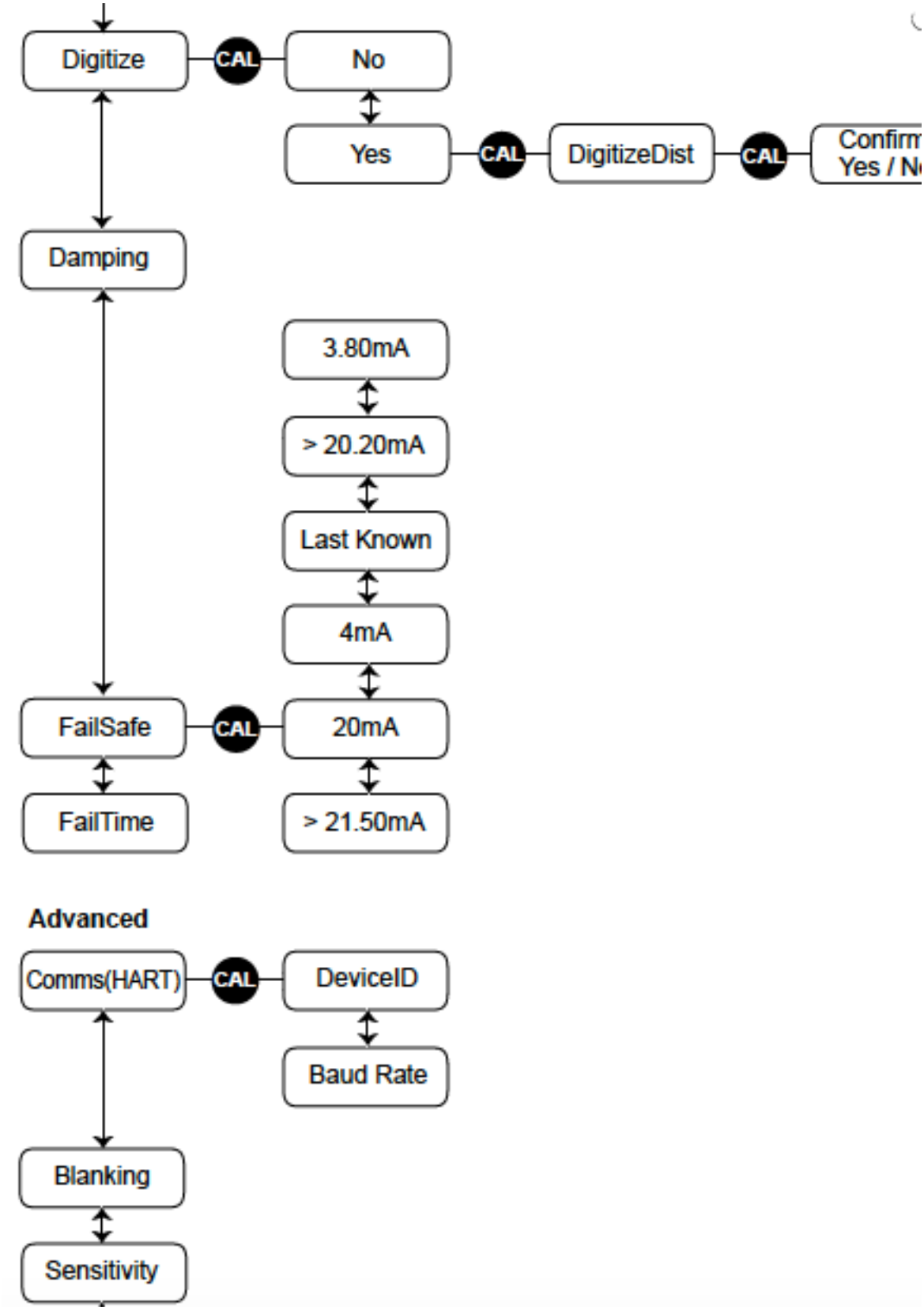


Autoset



Setup




Digitize
CAL
No
Yes
CAL
DigitizeDist
CAL
Confirm
Yes / N
Damping
3.80mA
> 20.20mA
Last Known
4mA
20mA
> 21.50mA
FailSafe
CAL
FailTime
Advanced
Comms(HART)
CAL
DeviceID
Baud Rate
Blanking
Sensitivity

Troubleshooting

Problem	Check
Display is blank Unit continually re-starts	Check incoming power on loop is to specification. Check incoming power on loop is continuous. Bench test with new 24V supply.
Measurement is non-responsive (material touching probe)	Run Digitize routine. If routine has already been run, Lower Dielectric selection or increase Sensitivity parameter. Check unit status for 'Failsafe'. The unit will go to Failsafe if it cannot detect any reflections. Check the probe element for damage or excessive build up. Ensure mounting is correct to specification with good ground reference. Ensure probe is not touching the vessel. Place current meter in line with loop. Ensure the 4-20mA is proportional to level reading based on High and Low level.
Unit is indicating a material level while no material is present	**A) If the unit is indicating full / high** Ensure no structure is making contact with the probe. Check for build up bridging between the probe and vessel / nozzle Run Digitize routine while no material is contacting the probe. Set Display Mode to Distance, note the measurement. If distance is near high level use Blanking to eliminate reflection interference. Adjust High level to ensure it is not within the Blanking range. **B) If the unit is indicating other level** The unit should measure the end of probe while nothing is touching the probe. Run Digitize routine while no material is contacting the probe. Confirm 'Low Level' is set correctly. Ensure no structure is making contact with the probe. Check for excessive build up and clean the probe. Ensure mounting is correct to specification with good ground reference. Place current meter in line with loop. Ensure the 4-20mA is proportional to level reading based on High and Low level. Use 4mA and 20mA tuning to force the output reading to each value to ensure the current control is operating correctly.
PLC reading does not match reading on display	Connect a Multimeter in series with the powered loop. Compare the 'mA' diagnostic on the display with the mA reading on the loop. If these values do not match, disconnect the loop wires and measure the resistance across the loop. This should not exceed specification. Confirm High Level and Low Level are set to the same values in Tracer 3000 and control system.

Troubleshooting (con't)

Unit measurement is locked at or near end of probe	The material touching the probe may not be generating a large enough reflection in the application conditions. Ensure unit is mounted as per specifications. Take note of the ground reference requirement. Ensure the probe is not making contact with the vessel. Use a minimum 2" / 50mm flange to improve signal transmission. Change unit Tracking to 'Demo' mode to measure closest echo instead of largest. Increase Sensitivity.
The probe is too long	Non-hazardous rated units can have the probe length cut to requirement. For flexible probes release the cable weight by undoing grub screws. After adjusting the probe ensure the new probe length is recorded on site. Update ProbeCalibrt parameter to new length. Do not adjust the probe of hazardous location rated units.
Adjusting / commissioning the unit without removing the lid	You will require a HART to PC connector and Tracer 3000 software.
Digitize Fails	The digitization process will fail if the unit cannot detect a measurable difference between the largest false reflection and the reflection generated by either the end of probe or the material touching the probe. Choose a lower Dielectric pre-set and re-run Digitize. Increase Sensitivity value and re-run Digitize. Ensure the Digitize distance is not greater than the material level. Ensure no structure is making contact with the probe. Check for excessive build up and clean the probe. Ensure mounting is correct to specification with good ground reference.
Digitize displays incorrect distance	If Digitize displays a closer distance than the material level / end of probe enter the distance to the correct material level. The unit will automatically eliminate the detected echo and find the correct level. If Digitize displays a longer distance than the material level the measured material may not be returning a large enough signal. Increase Sensitivity and change Tracking to 'Test' mode. Ensure unit has conforming ground reference. If Digitize displays a longer distance than the end of the probe length adjust see 'Measurement Accuracy' below or the 'ProbeLength' parameter in 'Advanced' menu if the Probe length has been modified.
Measurement Accuracy	Material / Dielectric or environment can create small measurement inaccuracy. Run Dist Calibrt parameter in software to manually adjust measured distance to new value.