TLR – RADAR LEVEL TRANSMITTER

The label *Trafag Industrial Components* extends the Trafag brand name to instruments manufactured by qualified partner companies.
The label *Trafag Industrial components* offer high-quality portfolio radar level transmitters. The ideal sensor for non-contact level measurement in a wide range of applications.

The principle of operation of this instrument is based on a high frequency band, enabling a very accurate detection of the level of media with a small emitting angle.

Applications

- Water/wastewater field
- Hydraulics
- Chemical
- Food and beverage
- Vast range of liquids
- Vast range of solids

Features

- Accurate reading measurement.
- Small emitting angle.
- High frequency band technology.
- "Medi-um window" function (the sensor is sensitive only to the set medium and does not react to substances with lower and higher permittivity)
- Easy to mount with direct or remote installation.
- Bluetooth programming and settings using a dedicated App.

XX/2025

Data sheet XXXXXX

Standard specifications	
Power supply	Two-wires DC (22V-30V); Four-wires (12…30VDC)
Output type	4…20 mA, Modbus RS485, Hart protocol, Bluetooth
Technology	77…81 GHz
Protection class	IP 67
Process pressure	-1...3 bar (optional -1…+16bar with flange)
Relative humidity	45…75%
Accuracy	±2mm
Beam Angle	±3°(Aluminum model with display) ±3.5°(PP and SS model)
Process temperature	-20°C ... +60°C (PP model) -20°C ... +60°C (SS model) -20°C … +70°C (Aluminum model with display) -40°C…+200°C (Aluminium model with display, cooling tower and PTFE lens)
Process connection	Thread G 1 ½ "(PP model), thread G 1 ½''/ 2'' (SS model), thread G 2'' (Aluminum model with display) and customized flanges for all models
Measuring range	Up to 30m (Aluminum model with display), up to 50m (PP and SS model)
Measuring cycle time	< 300 ms

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Ordering code

		TLR	X	-	X	-	XX	-	XXXX	-	X	-	XX	-	XXX
Version[1]	PP (polypropylene)		P												
	Stainless Steel SS304		S												
	Aluminium with display		D												
Media	Liquids				L										
	Solids				S										
Range	10 m						01								
	20 m						02								
	30 m						03								
	50 m						05								
Process Connections	Thread G 1 1/2''								G1.5						
	Thread G 2 ''								G2.0						
	Customised Flange AISI 304								FX.4						
	Customised flange for high temperatures[2] DN50 PN16 AISI 304								FH.4						
	Customised flange for hight temperatures[2] DN50 PN16 AISI 316L								FH.6						
Output	4…20mA, Modbus, Bluetooth 2+2 wires										B				
	4…20mA, Modbus, Hart protocol 2+2 wires										H				
	4…20mA, Bluetooth (4 wires)										A				
	Modbus, Bluetooth (4 wires)										M				
Protection class	IP 67												67		
Electrical connection	M20x1.5(F)														E01
	½'' NPT														E02
	Cable 1m														C01
	Cable 2m														C02
	Cable 5m														C05
	Cable 10m														C10
	Cable 30m														C30
	Cable 50m														C50

[1] See table "Variants"
[2] Max 200°C (at process connection)

Order example

Ex: TLR-P-L-01-G1.5-B-67-C01

- PP (polypropylene)
- Liquids
- 10m
- Thread BSP 1.5''
- 4…20mA, Modbus, Bluetooth
- IP67
- Cable 1m

Variants

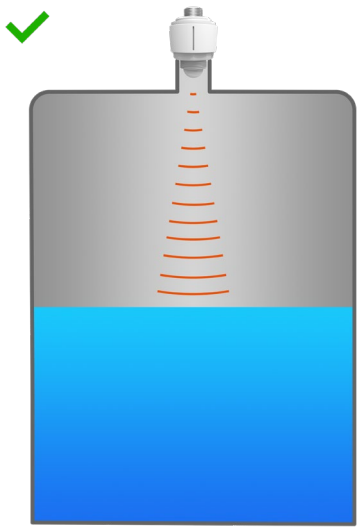
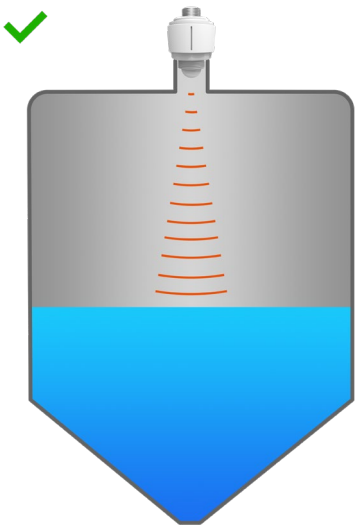
Tab.1

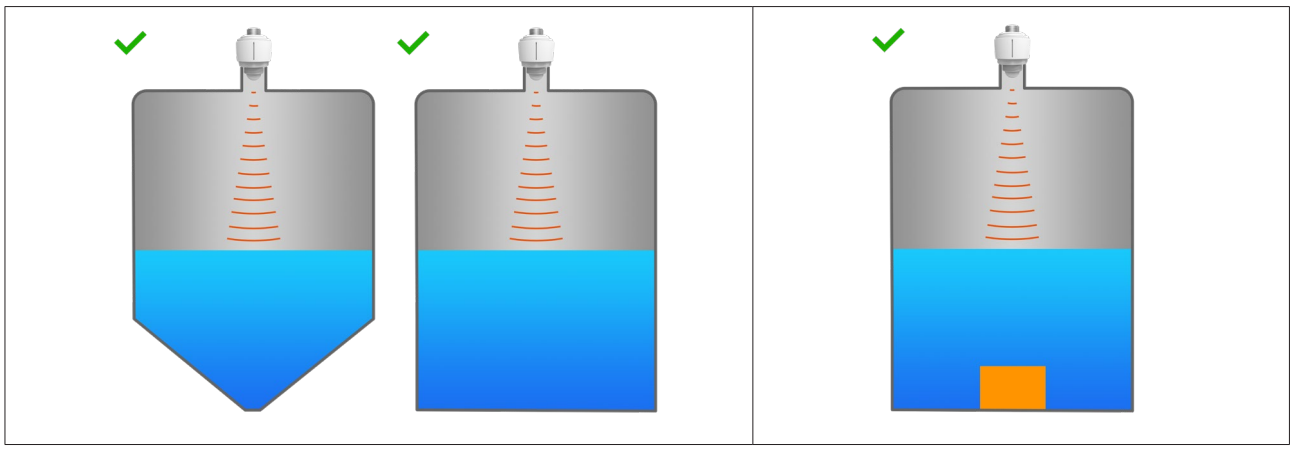
Version	Picture	Media	Process connections	Range (m)	Output	Electrical connections
P		Liquid	G1 ½', FX.X	10,20,30,50	A,B,M	Cable (C01, C02, C05, C10, C50)
S		Liquid	G1 ½'', G2'', FX.X	10,20,30,50	A,B,M	Cable (C01, C02, C05, C10, C50)
D		Liquid Solid	G2'', FX.X	10,20,30	H	E01, E02

Installation instructions

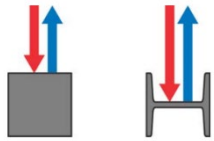
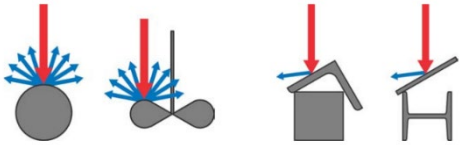
TLR can be mounted in the centre or close to the edge (side) of the tank, but some guidelines must be considered to avoid the happening of wrong readings, false echoes and reflections:

CENTER MOUNTING

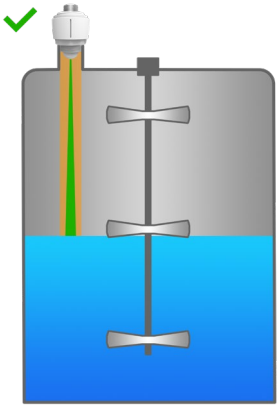
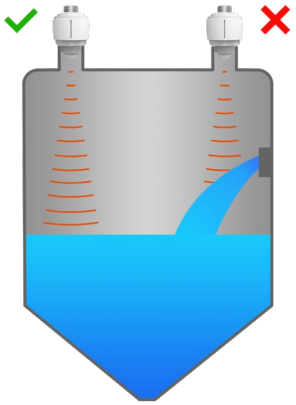
Flat ceiling	Flat ceiling with conical tank bottom
	
Flat ceiling without internal operating mechanics	Flat ceiling without internal parts provoking false readings *



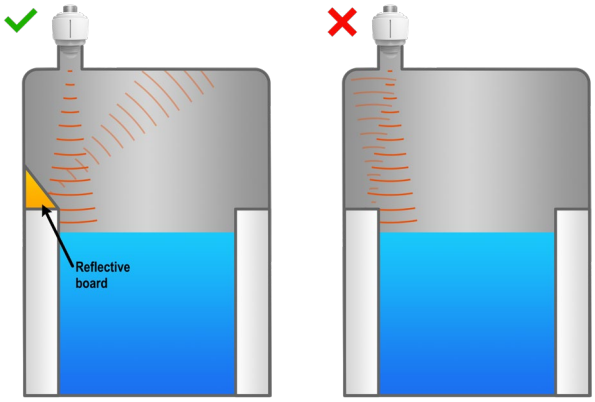
* There're structural or mechanic parts of any kind not provoking false reading signals:

Allowed	Not allowed
	

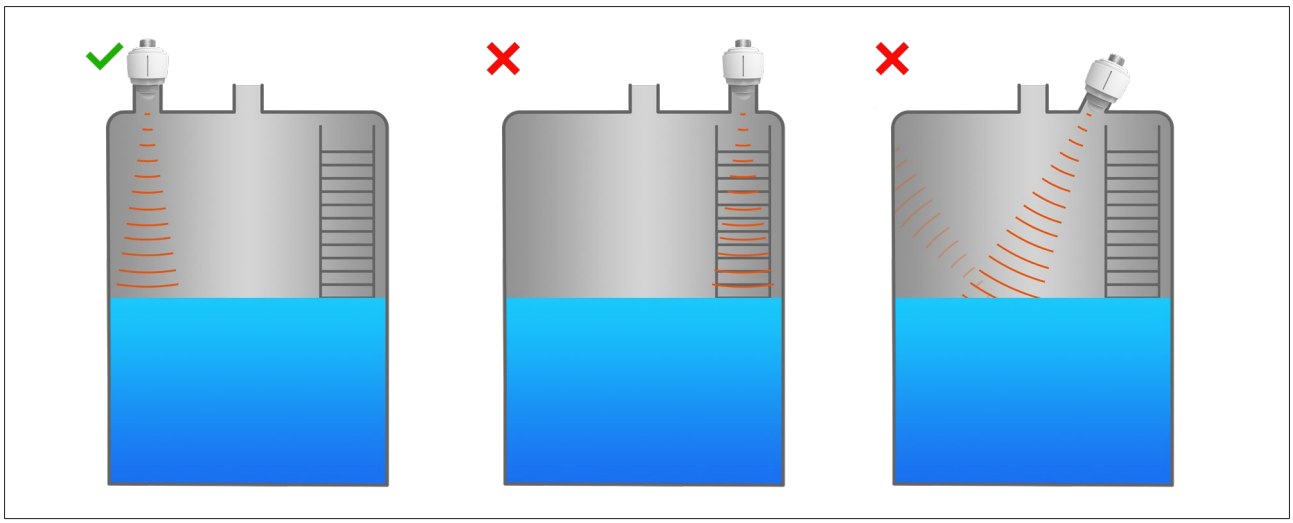
SIDE MOUNTING (close to the edge) – Flat, cylindrical, conical tank ceiling, bottoms or others

Mixers or internal operating parts	Pipes
	

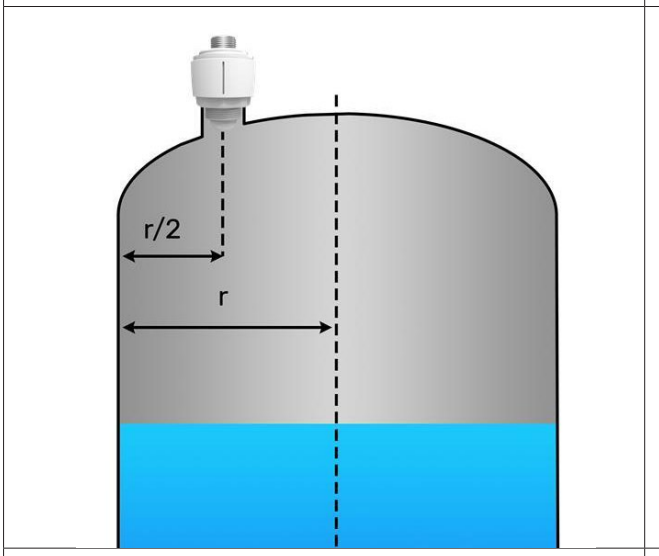
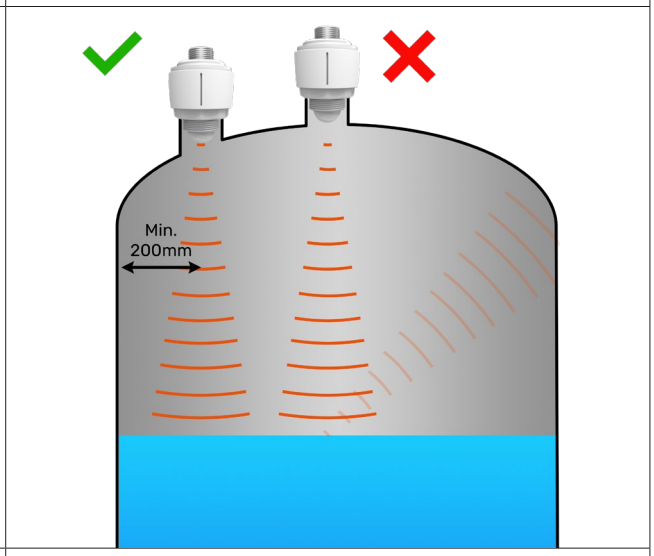
Disconnected parts require reflective boards



Foreign bodies



To calculate the minimum distance to the edge of the tank:

STANDARD (r/2)	OPTIONAL (200mm)
	
The standard "safety distance" is equal to r/2 of the tank but possible encumbrances must always be considered	The minimum 200mm from the edge of the tank could be considered in the lack of encumbrances

STANDARD SAFETY DISTANCE FORMULA

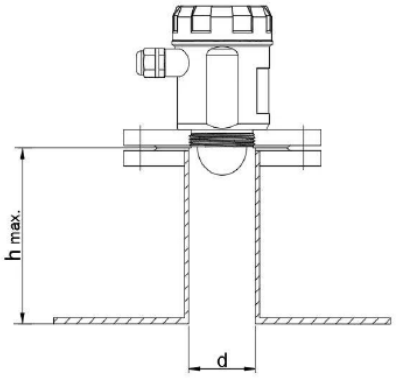
To calculate the standard safety distance (d) according to the height of the tank (h), it's appropriate to use the following formula:
d= h*TAN (rx)
h= height of the tank in mm
rx= rad (1.75°) = 0.0305

h [mm]	d [mm]
1000	200
2000	200
3000	200
4000	122
5000	153

7500	229
10000	306
20000	611
30000	917
40000	1222
50000	1528

STUB MOUNTING

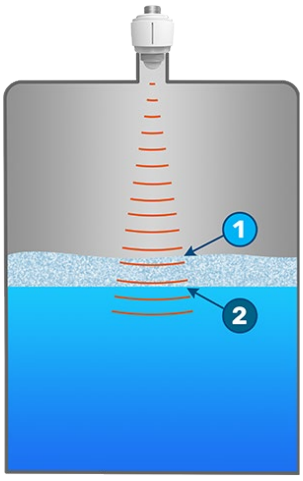
In the case of stub mounting, the stub should be as short as possible and the end should be rounded to minimize disturbing reflections but there're some guidelines to be considered:

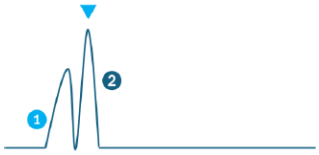
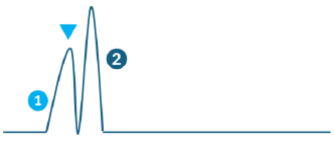


d	h MAX
40 mm	60 mm
50 mm	80 mm
80 mm	130 mm
100 mm	230 mm
150 mm	380 mm

Operating principles

When reading, TLR radar transmitters, in its basic configuration, tends to use the second echo (2) as the reference measurement since usually the first echo (1) is a false echo. Sometimes, however, the need is the first echo (1), so to make the sensor use the correct echo we must set the "Power One" parameter to the value 0.



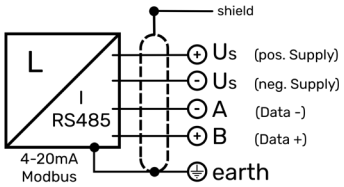
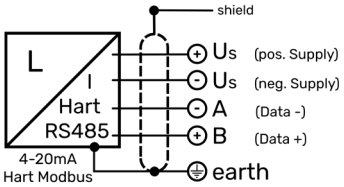
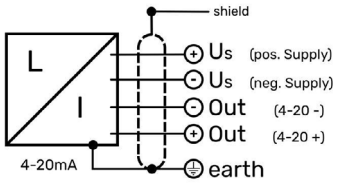
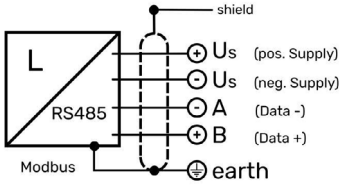
2nd Echo - Standard	
1st Echo - Power One (0)	

To have the correct measurement, there're two dead reading zones to be considered according to the measuring range:

Range	Standard dead reading zone	Configurable
10 m	200 mm	100 mm
20,30,50 m	200 mm	

Output

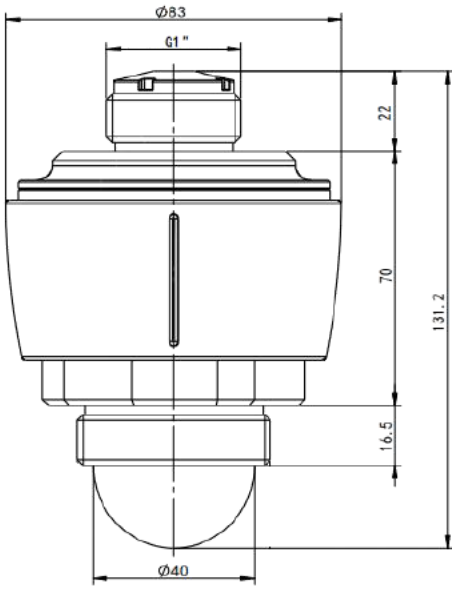
Tab.2 – Electrical connection schema

Schema	Wires	Output code
	Red (+) / Positive power supply Blue (-) / Negative power supply, OUTPUT 4…20 mA Green(-) / RS-485 communication negative Yellow (+) / RS-485 communication positive	B
	Red (+) / Positive power supply Blue (-) / Negative power supply, OUTPUT 4…20 mA / HART Green (-) / RS-485 communication negative Yellow (+) / RS-485 communication positive	H
	Red (+) / Positive power supply Blue (-) / Negative power supply Green (-) / 4…20 mA communication negative Yellow (+) / 4…20 mA communication positive	A
	Red (+) / Positive power supply Blue (-) / Negative power supply Green (-) / RS-485 communication negative Yellow (+) / RS-485 communication positive	M

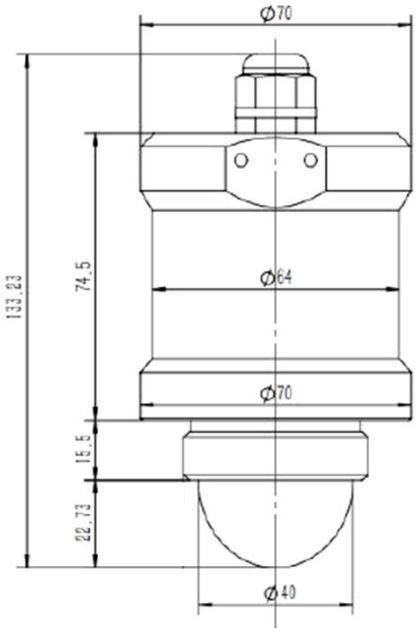
Dimensions – All dimensions are in mm

Tab.3 - Dimensions

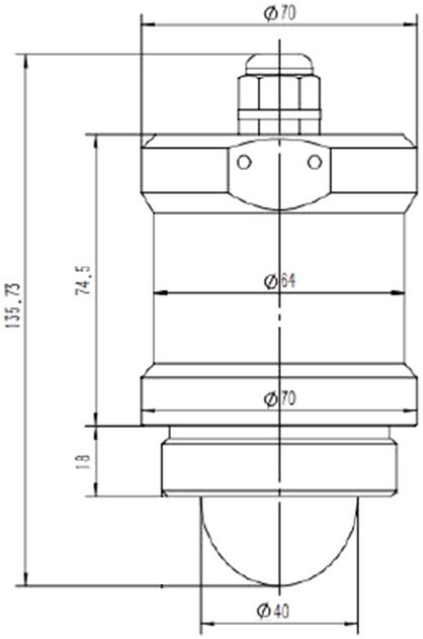
TLR-P-(…)-G1.5



TLR-S-(…)-G1.5



TLR-S-(…)-G2.0



TLR-D-(…)-G2.0