



Product sheet

873 SmartRadar storage tank level measurement

The SmartRadar is the first radar level gauge based on Digital Planar Technology

benefits

W&M approved

Easy to install

Lightning proof

Extremely reliable

Maintenance free

Digital Planar Technology (DPT) is the combination of Digital Signal Processing and innovative Planar Antenna Technology. This results in an accuracy performance beyond Weights & Measures requirements.

Due to its modular design, the SmartRadar can be used for any application. The wide range of different Planar Antenna's enables the installation on all available roof nozzles and stilling wells.

Installing the SmartRadar on your tank is easy. Even if your tank is in service. No special tools are required to install the antenna. The light weight construction allows one hand carrying.

An unique tank separator provides both an approved and a safe process seal.

The Control Unit can be mounted at any position; either at the ground level or on the tank roof. The unit is standard provided with a local display.

An infra-red connector is available for the Portable Enraf Terminal for safe and easy commissioning. This Control Unit is a common part of all SmartRadar types.

Additional functions, such as relay outputs, spot and average temperature and pressure transmitter inputs, can be easily added.

The communication and power in- and outputs are galvanically isolated.

SmartRadar is the smart solution for tank gauging!



WE THINK TANK

Measuring specifications

Measuring range	: 0 m to 40 m (0 ft to 131 ft), with RoD antenna 0 m to 18 m (0 ft to 59 ft)
Minimum ullage	: 0.5 m (1.6 ft), with high pressure antenna 0.5 m (1.6 ft) from cone end
Instrument accuracy	: ± 0.4 mm (0.016") *)
Measuring resolution	: 0.1 mm (0.004")

Principles

Measuring principle	: FM Synthesized Pulse Reflectometer
Signal processing	: Advanced Digital Signal Processing (ADSP)
Operating frequency	: X-band (9.15 GHz to 10.85 GHz)

Mechanica

Antenna Unit

Dimensions	: See drawing opposite
Weight	: 5 kg (11 lb) excluding antenna and tank separator
Cable entries	: 1 pcs 1/2" NPT (Pending on regulations Ex-d cable gland must be used)

Control Unit

Dimensions	: See drawing opposite
Weight	: 14 kg (31 lb)
Cable entries	: 5 pcs 3/4" NPT (Pending on regulations Ex-d cable glands must be used)

Environmental

Ambient temperature	: -40 °C to +60 °C (-40 °F to +140 °F)
Storage temperature	: -50 °C to +85 °C (-58 °F to +185 °F)
Protection class	: IP 67 according to EN 60529 (For U.S. NEMA 4)
Safety	: Explosion-proof - EEx d IIB T6 or EEx de IIB T6 or EEx d [ia] IIB T6 or EEx de [ia] IIB T6 or EEx d [ib] IIB T6 or EEx de [ib] IIB T6 or EEx d [ia/ib] IIB T6 or EEx de [ia/ib] IIB T6 - Class 1, Division 1, Groups B, C and D, acc. ANSI / NFPA 70 (Factory Mutual)

Materials

Instrument unit housing	: Aluminum alloy EN AC-ALS:7Mg0,3 EN1706, mat. No. 3.2371
Instrument unit finish	: Chromatized according to MIL-C-5541C
O-ring Tank separator	: FPM / 80 (only with planar antennas)

Electrical

Power supply	: 110/130/220/240Vac (+10 % to -20 %), optional 65 V (+10 % to -20 %) also suitable for 230 V (+6 % to -6 % according to CENELEC)
Frequency variations	: 45 / 65 Hz
Power rating	: 35 VA, $I_{max} = 2$ A
Lightning protection	: Full galvanic separation via isolation transformers

Transmission

Type	: Serial, ASCII coded, Bi-Phase Mark modulated (BPM)
Protocol	: Standard Enraf fieldbus (GPU protocol)
Common mode rejection	: >150 dB
Cabling	: Two conductors, twisted pair, $R_{max} = 200 \Omega$ / line, $C_{max} = 1 \mu F$, max. length 10 km

Options

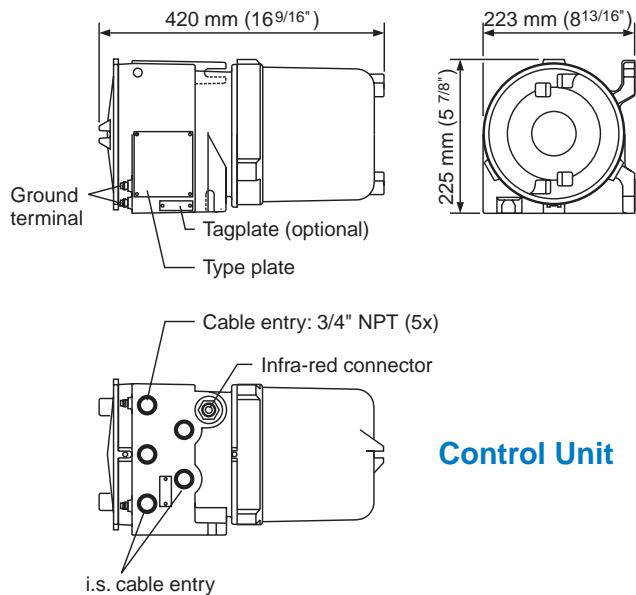
Alarm relay outputs	: 2x SPDT, galvanically isolated, $V_{max} = 240$ Vac, $I_{max} = 3$ A
Analog level output	: 4-20 mA (accuracy ± 0.1 % full scale)
Input boards	: Spot RTD's, average thermometers, digital pressure transmitters, WaterScout
Data transmission channel	: RS-232C or RS-485, for indoor use or radio modem connection

*) Under reference conditions

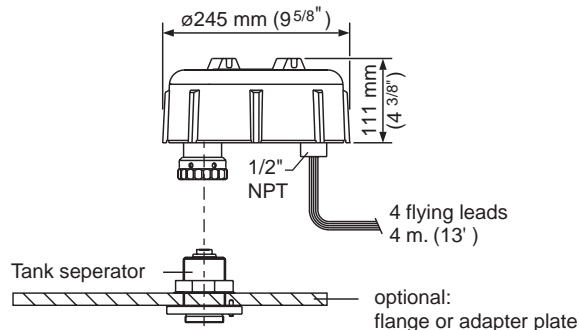
Identification code

Pos 1		Application										
U		General purpose										
X		W&M certified										
Pos 2		Data transmission										
E		Enraf Bi-phase mark protocol (standard)										
R		RS-232C (for indoor use or radio modem connection)										
S		RS-485 (for indoor use or radio modem connection)										
Pos 3		Pressure version										
A		Atmospheric										
M		Medium pressure 6 bar / 600 kPa (87 psi)										
H		High pressure 40 bar / 4 Mpa (580 psi) (pos. 11 = H)										
Pos 4		I/O options										
A		4 - 20 mA level output (if Pos. 2 = E)										
D		Temperature converter PT900 (Ex ia) + (pressure) transmitter HART protocol										
E		Spot temperature converter										
F		Spot temperature + (pressure) transmitter HART protocol										
G		Average temp. MIR interface + (pressure) transmitter HART protocol										
H		Average temp. MIT interface + (pressure) transmitter HART protocol										
K		Average temp. MIR interface + (pressure) transmitter Honeywell DE protocol										
L		Average temp. MIT interface + (pressure) transmitter Honeywell DE protocol										
M		Average temp. MIR interface										
N		Average temp. MIR interface + 4-20 mA level output										
O		Average temp. MIT interface										
P		Average temp. MIT interface + 4-20 mA level output										
Z		None										
Pos 5, 6, 7		Instrument designation										
8	7	3	SmartRadar									
Pos 8		Safety approvals										
F		FM USA										
P		FM/FCC USA										
Y		CENELEC Europe										
For other approvals please contact your nearest Enraf Office												
Pos 9		Alarms										
W		With programmable SPDT level alarm relay										
Z		None										
Pos 10		Mains supply										
A		220 V	50 / 60 Hz									
C		110 V	50 / 60 Hz									
K		240 V	50 / 60 Hz									
R		130 V	50 / 60 Hz									
S		65 V	50 / 60 Hz									
Pos 11 ... 15 see Product sheet SmartRadar antenna's												
Pos 16		Flange										
F		With optional flange										
P		With adapter plate										
*		Without flange										
U	E	A	Z	8	7	3	Y	Z	A	*	Typical identification code	
				8	7	3					Your identification code	

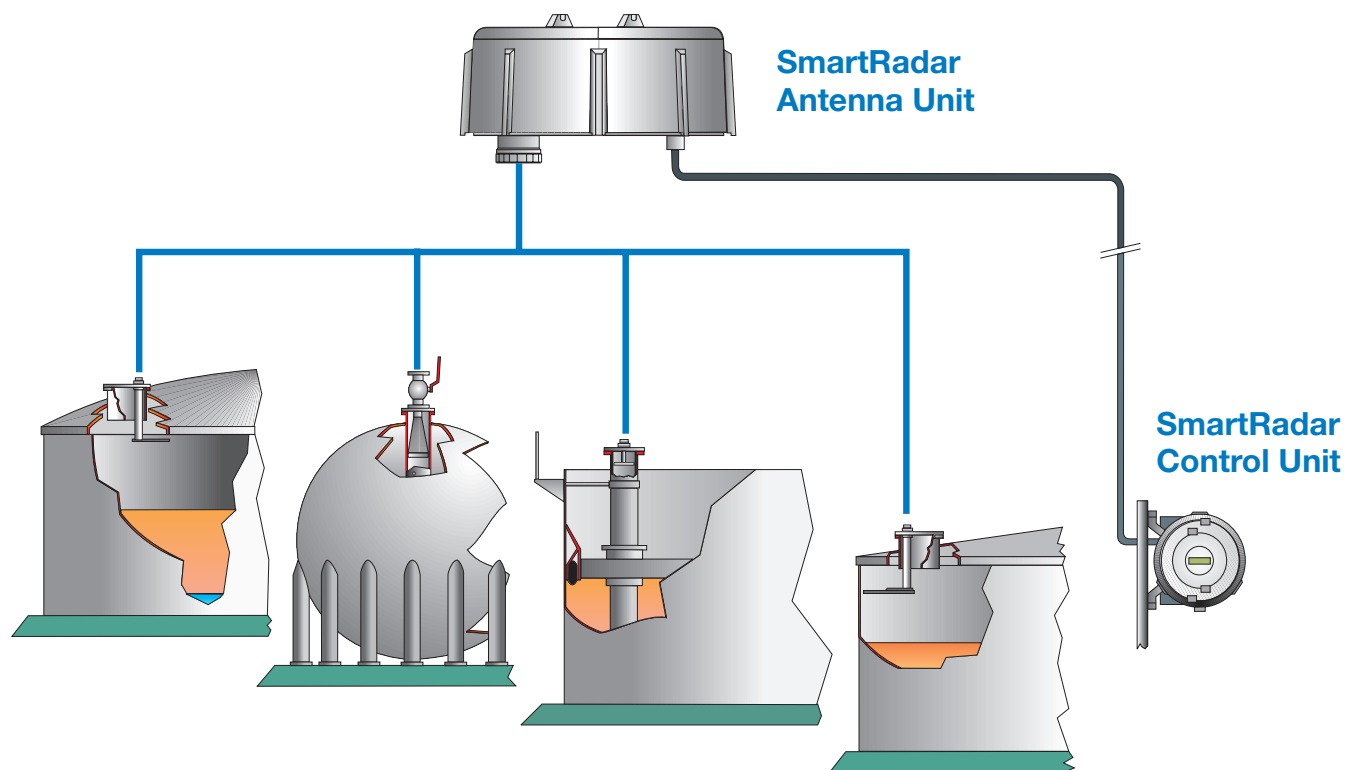
To achieve a complete identification code, combine the **Instrument identification code** and the **Antenna identification code** from the SmartRadar antenna's product sheet



Control Unit



Antenna Unit



We at Enraf are committed to excellence.

Enraf B.V.

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