



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.

A 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!



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Measuring specifications

Measuring range	: 0 m to 40 m (0 ft to 131 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 +65 °C (-40 °F to +149 °F)
Storage temperature	: -50 °C to +85 °C (-58 °F to +185 °F)
Protection class	: IP 67 according to EN 60529 (NEMA 4)
Safety	: Explosion-proof - II 1/2 G EEx d IIB T6 or EEx de IIB T6 or EEx d [ia/ib] IIB T6 or EEx de [ia/ib] IIB T6 according to ATEX - Class I, Division 1, Groups B, C and D, acc. to ANSI / NFPA 70 (FM USA)

Materials

Instrument unit housing	: Aluminum alloy EN AC-AISI7Mg0,3 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 V (+10% to -20%) and 230 V ($\pm 15\%$), optional 65 V (+10% to -20%), also suitable for 240 V (+10% to -20%)
Frequency variations	: 50 / 60 Hz ($\pm 10\%$)
Power rating	: 35 VA, $I_{\max} = 2$ A

Transmission

Type	: Serial, ASCII coded, Bi-Phase Mark modulated (BPM)
Isolation voltage	: > 1,500 V
Lightning protection	: Full galvanic separation via isolation transformers
Protocol	: Standard Enraf fieldbus (GPU protocol)
Common mode rejection	: >150 dB
Cabling	: Two conductors, twisted pair, $R_{\max} = 200 \Omega / \text{line}$, $C_{\max} = 1 \mu\text{F}$, max. length 10 km

Options

Alarm relay outputs	: 2x SPDT, galvanically isolated, $V_{\max} = 50$ Vac or 75 Vdc, $I_{\max} = 3$ A
Analog level output	: 4-20 mA (accuracy ± 0.1 % full scale)
Input board	: Spot RTD, VITO probes for average temperature and/or water measurement, HART® devices
Data transmission	: Standard Modbus via RS-232C or RS-485
Cable entries	: Adapters available to fit other sizes cable glands

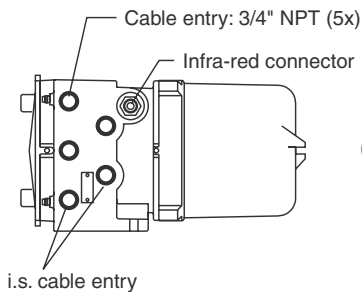
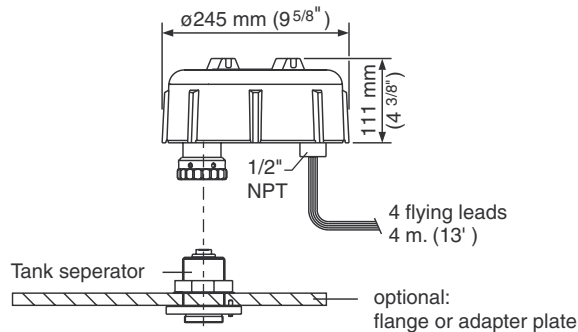
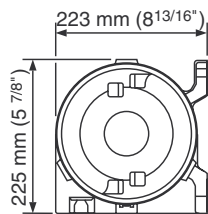
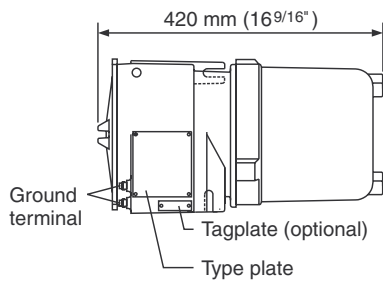
HART® is a trademark of the HART Communications Foundation.

*) Under reference conditions

Identification code

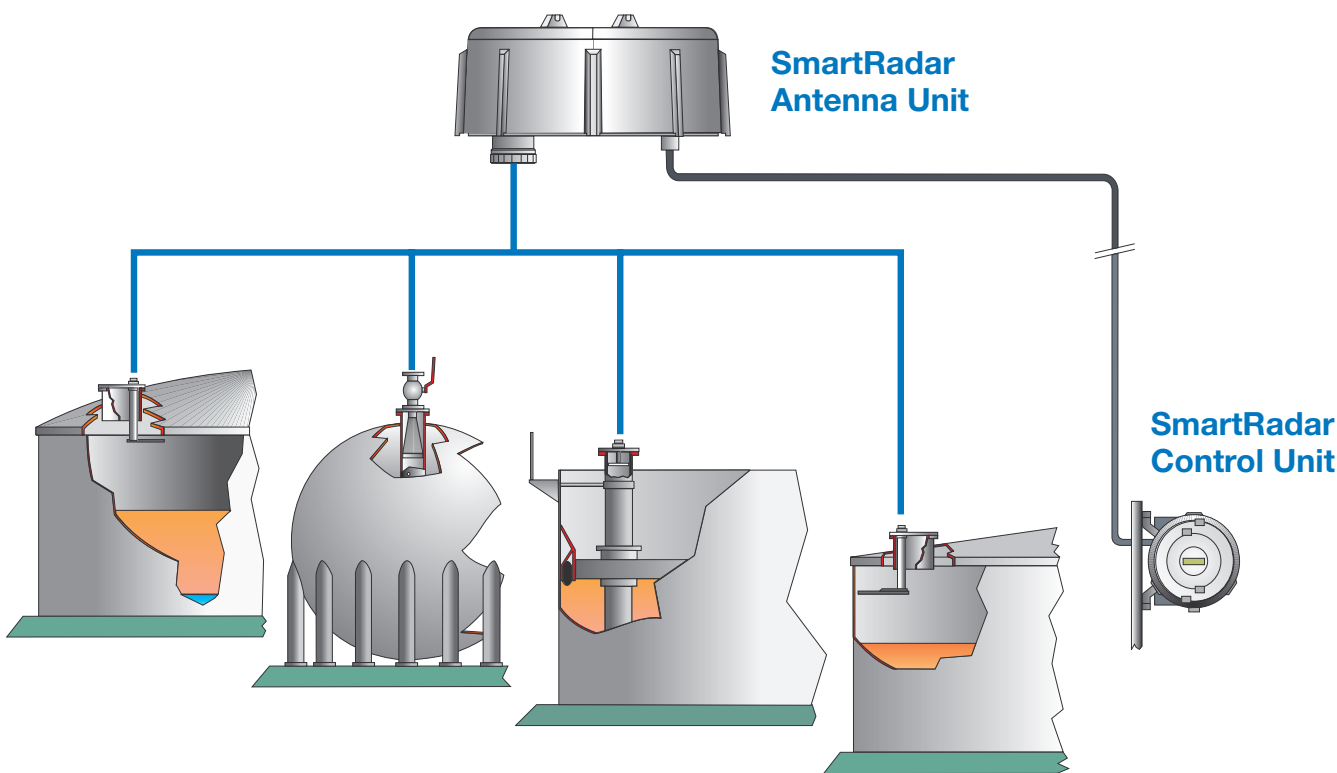
Pos 1 Application															
U	General purpose														
X	W&M certified														
Pos 2 Data transmission															
E	Enraf Bi-phase mark protocol (standard)														
R	RS-232C GPU protocol (only when Pos 4 = B, C, G, J, M, U or Z)														
S	RS-485 GPU protocol (only when Pos 4 = B, C, G, J, M, U or Z)														
V	RS-232C standard Modbus (only when Pos 4 = B, C, G, J, M, U or Z)														
W	RS-485 standard Modbus (only when Pos 4 = B, C, G, J, M, U or Z)														
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															
B	Spot temperature Pt100														
C	VITO temperature and/or water probe														
G	Average temperature MIR interface + HART device(s)														
J	VITO temperature and/or water probe + HART device(s)														
M	Average temperature MIR interface														
N	Average temperature MIR interface + 4-20 mA level output														
U	Spot temperature Pt100 + HART device(s)														
V	Analog output														
W	Analog output + VITO temperature and/or water probe														
X	Analog output + VITO temperature probe														
Y	Analog output + spot temperature Pt 100 + VITO temperature and/or water probe + HART device(s)														
Z	None														
Pos 5, 6, 7 Instrument designation															
8	7	3	SmartRadar												
Pos 8 Safety approvals															
A	ATEX Europe														
F	FM USA														
P	FM/FCC USA														
For other approvals please contact your nearest Enraf office															
Pos 9 Alarms and display															
W	With 2 programmable SPDT alarms														
Z	No alarms														
Pos 10 Mains supply															
A	220 V 50/60 Hz														
C	110 V 50/60 Hz														
K	230 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															
8	7	3													
Pos 16 Flange															
F	With optional flange														
P	With adapter plate														
Z	Without flange														
U	E	A	Z	8	7	3	A	Z	A					Z	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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