

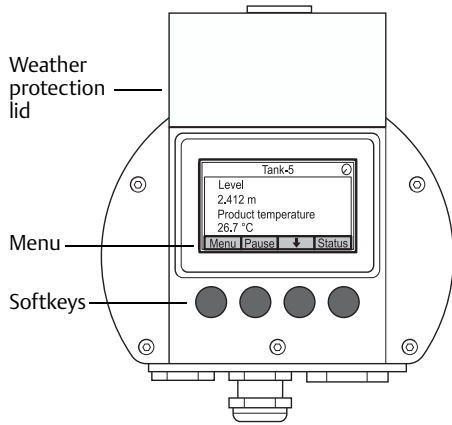
Rosemount 2230 Graphical Field Display

Remote data access
for tank gauging systems



- Monitor real time tank gauging data such as level, temperature, pressure and total observed volume
- Choose between 7 languages and several view options
- Install in hazardous areas
- Obtain excellent readability with back-lit display
- Get legal custody transfer read-out
- Benefit from a 2-wire, low voltage Tankbus for easy and safe installation

Rosemount 2230 Graphical Field Display



Tank data where you need it

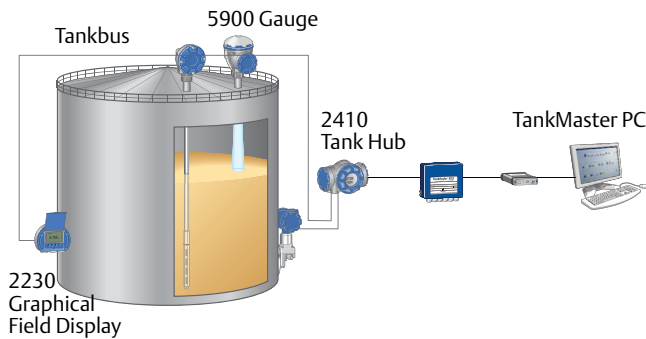
Rosemount 2230 Graphical Field Display presents inventory tank gauging data such as level, temperature, and pressure. This back-lit user friendly display is designed for tough environments, and can be installed in hazardous (Ex) locations, on the tank roof or near the tank. It is approved for legal custody transfer.

- Rosemount 2230 can display data from devices connected to a 2410 Tank Hub for maximum 10 tanks.
- The four softkeys allow you to navigate through the different menus to provide all tank data, directly in the field.
- The 2230 display is powered by the FISCO Tankbus.

Flexible installation

The intrinsically safe 2230 display can be installed in hazardous (Ex) areas, either on the tank roof or at the foot of the tank for a flexible and convenient read-out of tank data.

- Wiring can be daisy-chained via the 2230 terminals to other devices on the Tankbus. Rosemount 2230 has a built-in Tankbus terminator which can be connected if required.
- The 2230 display is designed to be mounted on a plate towards a wall, or on a pipe by using the optional mounting kit.
- A protecting lid prevents degradation of the LCD display due to sunlight exposure.



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Ordering information

Table 1. 2230 Graphical Field Display ordering information

Model	Product Description
2230	Graphical Field Display
Default Language	
E	English
S	Spanish
G	German
F	French
P	Portuguese
I	Italian
C	Chinese
Tankbus: Power and Communication	
F	Bus powered 2-wire FOUNDATION™ fieldbus (IEC 61158)
Firmware	
S	Standard
Hazardous Location Certification	
I1	ATEX Intrinsic Safety
I2	Brazil Inmetro Intrinsic Safety
I5	FM-US Intrinsic Safety
I6	FM-Canada Intrinsic Safety
I7	IECEX Intrinsic Safety
KA	ATEX Intrinsic Safety+FM-US Intrinsic Safety
KC	ATEX Intrinsic Safety+IECEX Intrinsic Safety
KD	FM-US Intrinsic Safety+FM-Canada Intrinsic Safety
NA	None
Custody Transfer Type Approval	
R	OIML R85 E performance certification
C ⁽¹⁾	PTB Eich (German W&M)
N ⁽¹⁾	NMi (Dutch W&M)
0	None
Housing	
A	Standard enclosure (IP 66/67). Polyurethane-covered aluminium

Table 1. 2230 Graphical Field Display ordering information

Cable / Conduit Connections	
1	1/2-14 NPT and 3/4-14 NPT adapters, female thread. 3 adapters and 2 plugs included
2	M20 x 1.5 and M25 x 1.5, female thread. Includes 2 plugs
G	Metal Cable Glands (M20 x 1.5 and M25 x 1.5). Minimum temperature -20 °C (-4 °F). ATEX / IECEx Exe approved. 2 plugs included
E	Eurofast Male, M20 x 1.5 and M25 x 1.5. 3 plugs included
M	Minifast Male, M20 x 1.5 and M25 x 1.5. 3 plugs included
Mechanical Installation	
W	Wall installation kit included
P	Mounting kit for both wall and pipe installation (1-2 in. vertical and horizontal pipes)
Options – none or multiple selections are possible	
WR3	Extended Product Warranty: 3-year limited warranty
WR5	Extended Product Warranty: 5-year limited warranty
ST	Engraved SST tag plate (provide tag information in order)
Typical Model Number: 2230 E F S I5 R A 1 P ST	

(1) Approval plate included. Requires 5900S Radar Level Gauge and 2410 Tank Hub with corresponding Custody Transfer Type Approval.

Specifications

Toggle time

The time each value or set of values are displayed: 2-30 s.

Language selection possibilities

English, French, German, Spanish, Italian, Chinese and Portuguese.

Variables to display

Level, level rate, ullage, signal strength, volume (TOV), liquid average temperature, 1-16 spot temperature, vapor average temperature, ambient temperature, free water level, vapor pressure, liquid pressure, air pressure, observed density, and flow rate.

Units to display

- Level, free water level, and ullage: meter, millimeter, feet, or imperial 1/16
- Level rate: meter/second, meter/hour, feet/second, or feet/hour
- Flow rate: meter³/hour, liter/minute, feet³/hour, barrel/hour, or US gallon/hour
- Total Observed Volume (TOV): meter³, liters, feet³, barrel, or US gallon
- Temperature: °F, °C, or °K.
- Pressure: psi, psiA, psiG, bar, barA, barG, atm, Pa, or kPa
- Density: kg/m³, kg/liter, or °API
- Signal strength: mV

View Options

- **Select View:** “Single Value”, “Two Values” or “Four Values”. The single value view presents large 25 mm (1 in.) digits
- **Options:** Units, tanks (all/default/custom), variables to display, toggle time, and display language
- **Service:** To adjust LCD contrast, show custody transfer view, make a factory reset, or activate an LCD test feature

Electric

Power supply

Input voltage U_i for FOUNDATION™ fieldbus:

- 9.0 to 17.5 VDC in FISCO applications
- 9.0 to 30 VDC in Entity applications

Tankbus current draw

30 mA

Display type

Back-lit LCD monochrome display, 128x64 pixels.

Start-up time

5 s

Update rate

New values to display once every two seconds.

Response time

< 0.5 s from released button to new image.

Cable entry (connection/glands)

Three entries, two M20×1.5 and one M25×1.5. Two metal plugs to seal any unused ports are included in the delivery.

Optional:

- ½ - 14 NPT conduit / cable adapter
- Cable glands in metal (½ - 14 NPT)
- 4-pin male Eurofast connector or A size Mini 4-pin male Minifast connector

Tankbus cabling

AWG 0.5-1.5 mm² (22-16), shielded twisted pairs.

Built-in Tankbus terminator

Yes (to be connected if required).

FOUNDATION™ fieldbus characteristics

Polarity sensitive

No

Quiescent current draw

30 mA

Lift-off minimum voltage

9.0 VDC

Device capacitance / inductance

See “Product certifications”

Class (Basic or Link Master)

Link Master (LAS)

Number of available VCRs

Maximum 38. Client and server=20, Publisher=20, Subscribers=20, Source=2, Sink=0.

Links

Maximum 32

Minimum slot time / maximum response delay / minimum intermessage delay

8 / 5 / 8

Blocks and Execution time

1 **Resource** block, 3 **Transducer** blocks (Main, Register, Display)
4 **Multiple Analog Output** (MAO) blocks: 15 ms.
For more information, see the FOUNDATION™ fieldbus Blocks manual (document number 00809-0100-4783)

Instantiation

No

Conforming FOUNDATION™ fieldbus

ITK 6

Field Diagnostics support (NAMUR 107)

Yes

Action support wizards

Write protect device, factory reset - device configuration, reset statistics, start/stop alerts simulation, restart communication

Advanced diagnostics

Software, memory/database, electronics, internal communication, configuration, model code, internal temperature, MAO fault state

Mechanical

Housing material

Polyurethane-covered die-cast aluminum.

Dimensions (width x height x depth)

150 x 120 x 78 mm (5.9 x 4.7 x 3.1 in.)

Weight

1.2 kg (2.6 lbs)

Environment

Ambient temperature

-20 to 70 °C (-4 to 158 °F)

Storage temperature

-30 to 85 °C (-22 to 185 °F)

Humidity

0-100% relative humidity, non-condensing.

Ingress protection

IP 66 and 67 (Nema 4)

Metrology sealing possibility

Yes

Write protect switch

Yes

Transient / built-in lightning protection

According to IEC 61000-4-5, level 1 kV line to ground. Complies with IEEE 587. Category B transient protection and IEEE 472 surge protection.

Installation and Configuration

The 2230 display can be installed either on the tank roof or at the foot of the tank for a flexible and convenient read-out of tank data.

Cabling can be daisy-chained via the 2230 terminals to other devices on the Tankbus. A terminator is required at each end of the Tankbus to ensure the fieldbus network will have proper signal levels. Generally, one terminator is at the fieldbus power supply and the other is in the last device in the network. Rosemount 2230 has a built-in terminator which can be connected if required.

The display is designed to be mounted on a plate, towards a wall or similar. It is attached to the plate with four M4 screws. It is important to provide space for opening the lid. The protecting lid prevents degradation of the LCD display due to sunlight exposure.

Configuration is done locally via the device's graphical menu and built-in buttons or remotely by using the TankMaster WinSetup software.

For more information, see the Rosemount 2230 Reference Manual (document number 00809-0100-2230) or the Rosemount TankMaster WinSetup Reference Manual (document number 300510EN).

Product certifications

Ordinary location certification

Complies with FM 3810:2005 and CSA: C22.2 No. 1010.1

CE-mark

Complies with applicable EU directives (EMC, ATEX)

Electro Magnetic Compatibility

Emerson Process Management complies with the EMC Directive.

SPECIAL CONDITIONS FOR SAFE USE (X-MARKING), ATEX AND IECEx SPECIAL CONDITIONS OF USE, FM-US AND FM-C

The non-metallic parts incorporated in the enclosure of this equipment may generate an ignition-capable level of electrostatic charge. Therefore particularly when it is used for applications that specifically require Division 1 and Group II, Zone 0 located equipment, the equipment shall not be installed in a location where the external conditions are conducive to the build-up of electrostatic charge on such surfaces. Additionally, the equipment shall only be cleaned with a damp cloth. The enclosure contains aluminum and is considered to present a potential risk of ignition by impact or friction. Care must be taken during installation and use to prevent impact or friction. The Model 2230 Graphical Field Display will not pass the 500 Vrms dielectric strength test and this must be taken into account during installation.

European ATEX Directive Information

EC-Type Examination Certificate Number: FM10ATEX0046X
Control Drawing: 9240 040-949

I1⁽¹⁾ Intrinsically Safe

FISCO Field Device (Fieldbus Terminals):



II 1 G 0075

Ex ia IIC T4 (-50 °C ≤ T_a ≤ +70 °C)

U_i=17.5 VDC, I_i=380 mA, P_i=5.32 W, C_i=2.1 nF, L_i=1.1 μH

Entity (Fieldbus Terminals):



II 1 G 0075

Ex ia IIC T4 (-50 °C ≤ T_a ≤ +70 °C)

U_i=30 VDC, I_i=300 mA, P_i=1.3 W, C_i=2.1 nF, L_i=1.1 μH

US Factory Mutual (FM-US) Certification

Certificate of Compliance: 3037177
Control Drawing: 9240 040-949

I5⁽¹⁾ Intrinsically Safe

FISCO Field Device (Fieldbus Terminals):

Intrinsically safe for Class I, II, III Division 1, Groups A, B, C, D, E, F, and G

Temperature Class T4, Ambient Temperature Limits: -50 °C to +70 °C

Class 1 Zone 0 AEx ia IIC T4 (-50 °C ≤ T_a ≤ +70 °C)

U_i=17.5 VDC, I_i=380 mA, P_i=5.32 W, C_i=2.1 nF, L_i=1.1 μH

Entity (Fieldbus Terminals):

Intrinsically safe for Class I, II, III Division 1, Groups A, B, C, D, E, F, and G

Temperature Class T4, Ambient Temperature Limits: -50 °C to +70 °C

Class 1 Zone 0 AEx ia IIC T4 (-50 °C ≤ T_a ≤ +70 °C)

U_i=30 VDC, I_i=300 mA, P_i=1.3 W, C_i=2.1 nF, L_i=1.1 μH

Canadian Factory Mutual (FM-C) Certification

Certificate of Compliance: 3037177C

Control Drawing: 9240 040-949



I6⁽¹⁾ Intrinsically Safe

FISCO Field Device (Fieldbus Terminals):

Intrinsically safe for Class I, II, III Division 1, Groups A, B, C, D, E, F, and G

Temperature Class T4, Ambient Temperature Limits: -50 °C to +70 °C

U_i=17.5 VDC, I_i=380 mA, P_i=5.32 W, C_i=2.1 nF, L_i=1.1 μH

Entity (Fieldbus Terminals):

Intrinsically safe for Class I, II, III Division 1, Groups A, B, C, D, E, F, and G

Temperature Class T4, Ambient Temperature Limits: -50 °C to +70 °C

U_i=30 VDC, I_i=300 mA, P_i=1.3 W, C_i=2.1 nF, L_i=1.1 μH

IECEx Certification

Certificate of Conformity Number: IECEx FMG 10.0021X
Control Drawing: 9240 040-949

I7⁽¹⁾ Intrinsically Safe

FISCO Field Device (Fieldbus Terminals):

Ex ia IIC Ga T4 (-50 °C ≤ T_a ≤ +70 °C)

U_i=17.5 VDC, I_i=380 mA, P_i=5.32 W, C_i=2.1 nF, L_i=1.1 μH

Entity (Fieldbus Terminals):

Ex ia IIC Ga T4 (-50 °C ≤ T_a ≤ +70 °C)

U_i=30 VDC, I_i=300 mA, P_i=1.3 W, C_i=2.1 nF, L_i=1.1 μH

Combination Approvals

KA=I1+I5 (ATEX + FM-US)

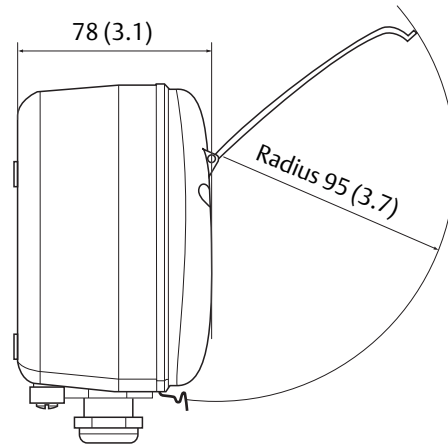
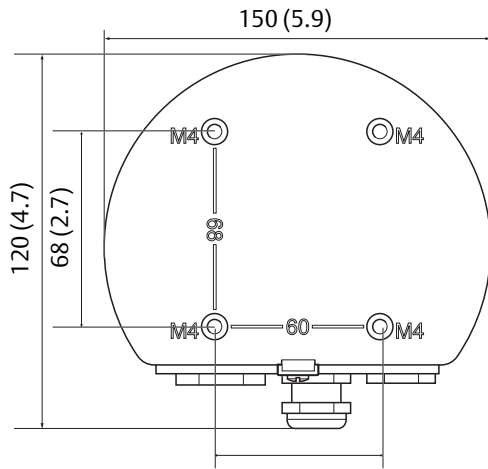
KC=I1+I7 (ATEX + IECEx)

KD=I5+I6 (FM-US+FM-C)

For details, see the Rosemount 2230 Reference Manual (document number 00809-0100-2230).

Dimensional drawings

Dimensions are in millimeters (inches)



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