Rosemount™ 2230 Graphical Field Display
for tank gauging systems

Monitor real time tank gauging data, such as level, temperature, pressure, and total observed volume

- Choose among seven 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
Tank data where you need it

Rosemount 2230 Graphical Field Display presents inventory tank gauging data such as level, temperature, and pressure. It is approved for legal custody transfer. This intrinsically safe field display is designed for tough environments and can be installed in hazardous (Ex) locations.

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

Flexible installation

The back-lit user friendly 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.

- Wiring can be daisy-chained via the Rosemount 2230 terminals to other devices on the Tankbus. The field display has a built-in Tankbus terminator, which can be connected if required.
- The field display is designed to be mounted on a wall or a pipe, using the same mounting arrangement as for other Rosemount Tank Gauging System units.
- A hinged lid protects the LCD display from sunlight exposure.

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# Ordering Information

**Table 1. Rosemount 2230 Graphical Field Display Ordering Information**

<table>
<thead>
<tr>
<th>Model</th>
<th>Product description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2230</td>
<td>Graphical Field Display</td>
</tr>
</tbody>
</table>

**Default language**

<table>
<thead>
<tr>
<th>Default language</th>
<th>Language</th>
</tr>
</thead>
<tbody>
<tr>
<td>E</td>
<td>English</td>
</tr>
<tr>
<td>S</td>
<td>Spanish</td>
</tr>
<tr>
<td>G</td>
<td>German</td>
</tr>
<tr>
<td>F</td>
<td>French</td>
</tr>
<tr>
<td>P</td>
<td>Portuguese</td>
</tr>
<tr>
<td>I</td>
<td>Italian</td>
</tr>
<tr>
<td>C</td>
<td>Chinese</td>
</tr>
</tbody>
</table>

**Tankbus: Power and communication**

<table>
<thead>
<tr>
<th>Power and communication</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>F</td>
<td>Bus powered 2-wire FOUNDATION™ Fieldbus (IEC 61158)</td>
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</table>

**Firmware**

<table>
<thead>
<tr>
<th>Firmware</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>S</td>
<td>Standard</td>
</tr>
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</table>

**Hazardous location certification**

<table>
<thead>
<tr>
<th>Hazardous location certification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>I1</td>
<td>ATEX Intrinsic Safety</td>
</tr>
<tr>
<td>I2</td>
<td>INMETRO Intrinsic Safety (Brazil)</td>
</tr>
<tr>
<td>I4&lt;sup&gt;(1)&lt;/sup&gt;</td>
<td>Japan Intrinsic Safety</td>
</tr>
<tr>
<td>I5</td>
<td>FM-US Intrinsic Safety</td>
</tr>
<tr>
<td>I6</td>
<td>FM-Canada Intrinsic Safety</td>
</tr>
<tr>
<td>I7</td>
<td>IECEx Intrinsic Safety</td>
</tr>
<tr>
<td>IM</td>
<td>Technical Regulations Customs Union (EAC) Intrinsic Safety</td>
</tr>
<tr>
<td>IP&lt;sup&gt;(2)&lt;/sup&gt;</td>
<td>KC Intrinsic Safety (South Korea)</td>
</tr>
<tr>
<td>IW</td>
<td>CCOE/PESO Intrinsic Safety (India)</td>
</tr>
<tr>
<td>NA</td>
<td>None</td>
</tr>
</tbody>
</table>

**Custody transfer type approval<sup>[3]</sup>**

<table>
<thead>
<tr>
<th>Custody transfer type approval</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>R</td>
<td>OIML R 85 edition 2008</td>
</tr>
<tr>
<td>C</td>
<td>PTB Eich (Germany)</td>
</tr>
<tr>
<td>K&lt;sup&gt;[4]&lt;/sup&gt;</td>
<td>GOST (Kazakhstan)</td>
</tr>
<tr>
<td>L</td>
<td>LNE (France)</td>
</tr>
<tr>
<td>N</td>
<td>NMi (The Netherlands)</td>
</tr>
<tr>
<td>S&lt;sup&gt;[4]&lt;/sup&gt;</td>
<td>GOST (Russia)</td>
</tr>
<tr>
<td>0</td>
<td>None</td>
</tr>
</tbody>
</table>
### Table 1. Rosemount 2230 Graphical Field Display Ordering Information

<table>
<thead>
<tr>
<th>Category</th>
<th>Details</th>
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</thead>
<tbody>
<tr>
<td><strong>Housing</strong></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>Standard enclosure (IP 66/67). Polyurethane-covered aluminium</td>
</tr>
<tr>
<td><strong>Cable/Conduit connections</strong></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>1/2–14 NPT Female thread, 1 plug included</td>
</tr>
<tr>
<td>2</td>
<td>M20 x 1.5 adapters Female thread, 2 adapters, 1 plug included</td>
</tr>
<tr>
<td>G</td>
<td>Metal cable glands (1/2–14 NPT) Minimum temperature -20 °C (-4 °F). ATEX/IECEEx Exe approved. 2 glands, 1 plug included.</td>
</tr>
<tr>
<td>E</td>
<td>eurofast® male connector 1 connector and 1 plug included</td>
</tr>
<tr>
<td>M</td>
<td>minifast® male connector 1 connector and 1 plug included</td>
</tr>
<tr>
<td><strong>Mechanical installation</strong></td>
<td></td>
</tr>
<tr>
<td>W</td>
<td>Wall installation kit included</td>
</tr>
<tr>
<td>P</td>
<td>Mounting kit for both wall and pipe installation 1-2 in. vertical and horizontal pipes</td>
</tr>
</tbody>
</table>

**Options (include with selected model number)**

<table>
<thead>
<tr>
<th>Tag plate</th>
<th>Engraved SST tag plate (provide tag information in order)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Extended warranty</strong></td>
<td></td>
</tr>
<tr>
<td>WR3</td>
<td>Extended product warranty: 3-year limited warranty Standard warranty: 18 months from delivery</td>
</tr>
<tr>
<td>WR5</td>
<td>Extended product warranty: 5-year limited warranty</td>
</tr>
</tbody>
</table>

**Typical model number:**  
2230 E F S I5 R A 1 P ST

1. Requires Default language code E.
2. Requires Custody transfer type approval code R or 0.
3. Requires Rosemount 5900S Radar Level Gauge and Rosemount 2410 Tank Hub with corresponding Custody transfer type approval.
4. Requires Hazardous location certification code IM.
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, ullage, level rate, signal strength, free water level (FWL), vapor pressure, liquid pressure, air pressure, ambient temperature, vapor average temperature, liquid average temperature, tank temperature, observed density, reference density, flow rate, volume (TOV), middle pressure, tank height, delta level, bargraph level, and bargraph ullage.

**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, barrel/hour, UK gallon/hour, or US gallon/hour
- Total Observed Volume (TOV): meter³, liter, barrel, UK gallon, 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)**
Two ½ - 14 NPT entries for cable glands or conduits. A metal plug to seal unused port is included in the delivery. Optional:
- M20×1.5 conduit/cable adapters
- 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” on page 7

**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.

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

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 Rosemount 2230 Graphical Field 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 Rosemount 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 Rosemount 2230 display can be installed on a wall or a 33.4-60.3 mm (1-2 in.) diameter pipe. It is important to provide space for opening the lid. The hinged lid protects the LCD display from 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 or the Rosemount TankMaster System Configuration Manual.

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
1.3 kg (2.9 lbs)
Product Certifications
Rev 4.6

European Directive Information
The most recent revision of the EU Declaration of Conformity can be found at Emerson.com/Rosemount

Ordinary Location Certification
As standard, the transmitter has been examined and tested to determine that the design meets the basic electrical, mechanical, and fire protection requirements by a nationally recognized test laboratory (NRTL) as accredited by the Federal Occupational Safety and Health Administration (OSHA).

Installing Equipment in North America
The US National Electrical Code® (NEC) and the Canadian Electrical Code (CEC) permit the use of Division marked equipment in Zones and Zone marked equipment in Divisions. The markings must be suitable for the area classification, gas, and temperature class. This information is clearly defined in the respective codes.

North America
I5 USA Intrinsic Safety
Certificate: FM17US0035X
Standards: FM Class 3600 – 2011,
FM Class 3610 – 2010,
FM Class 3810 – 2005,
ANSI/NEMA 250 – 2008,
ANSI/IEC 60529 – 2004,
ANSI/ISA 61010-1:2004
ANSI/ISA 60079-9 – 2013,
Markings: IS/I,II,III/1/ABCDEFG/T4 Ta = -50 °C to +70 °C
Control Dwg D9240040-949
I/0/AEx ia IIC Ga T4 Ta = -50 °C to +70 °C
Control Dwg D9240040-949
Type 4X; IP66, IP67

Specific Conditions for Safe Use (X):
1. 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.
2. 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.
3. The Rosemount 2230 Graphical Field Display will not pass the 500Vrms dielectric strength test and this must be taken into account during installation.
4. To maintain ingress protection ratings IP66 and IP67, PTFE tape or pipe dope is required for cable entries and blanking plugs.

I6 Canada Intrinsic Safety
Certificate: FM17CA0019X
Standards: CAN/CSA C22.2 No.157-1992 (R2012);
CAN/CSA C22.2 No. 1010.1:2004;
CAN/CSA C22.2 No. 25-1966 (R2014);
CAN/CSA C22.2 No. 94-M91:1991 (R2011);
CAN/CSA-C22.2 No. 60529-2005 (R2015);
CAN/CSA C22.2 No. E60079-0:2011;
CAN/CSA C22.2 No. E60079-11:2011
Markings: IS/I,II,III/1/ABCDEFG/T4 Ta = -50 °C to +70 °C
Control Drawing D9240040-949
I/o/AEx ia IIC Ga T4 Ta = -50 °C to +70 °C
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<table>
<thead>
<tr>
<th>Parameters</th>
<th>Value</th>
<th>Value</th>
<th>Value</th>
<th>Value</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ul</td>
<td>30 V</td>
<td>300 mA</td>
<td>1.3 W</td>
<td>2.1 nF</td>
<td>1.1 μH</td>
</tr>
<tr>
<td>FISCO parameters</td>
<td>17.5V</td>
<td>380 mA</td>
<td>5.32 W</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>
2. 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.

3. The Rosemount 2230 Graphical Field Display will not pass the 500Vrms dielectric strength test and this must be taken into account during installation.

4. To maintain ingress protection ratings IP66 and IP67, PTFE tape or pipe dope is required for cable entries and blanking plugs.

Europe

I1 ATEX Intrinsic Safety
Certificate: FM10ATEX0046X
Markings: Ex ia IIC T4 Ga (-50 °C to +70 °C); IP66, IP67

<table>
<thead>
<tr>
<th></th>
<th>Ui</th>
<th>li</th>
<th>Pi</th>
<th>Ci</th>
<th>Li</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entity parameters</td>
<td>30 V</td>
<td>300 mA</td>
<td>1.3 W</td>
<td>2.1 nF</td>
<td>1.1 μH</td>
</tr>
<tr>
<td>FISCO parameters</td>
<td>17.5 V</td>
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<td>5.32 W</td>
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</table>

Specific Conditions for Safe Use (X):

1. 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.

2. 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.

3. The Rosemount 2230 Graphical Field Display will not pass the 500Vrms dielectric strength test and this must be taken into account during installation.

4. To maintain ingress protection ratings IP66 and IP67, PTFE tape or pipe dope is required for cable entries and blanking plugs.

Brazil

I2 INMETRO Intrinsic Safety
Certificate: UL-BR 17.0949X
Markings: Ex ia IIC T4 (-50 °C ≤ Tamb ≤ +70 °C)

<table>
<thead>
<tr>
<th></th>
<th>Ui</th>
<th>li</th>
<th>Pi</th>
<th>Ci</th>
<th>Li</th>
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</thead>
<tbody>
<tr>
<td>Entity parameters</td>
<td>30 V</td>
<td>300 mA</td>
<td>1.3 W</td>
<td>2.1 nF</td>
<td>1.1 μH</td>
</tr>
<tr>
<td>FISCO parameters</td>
<td>17.5 V</td>
<td>380 mA</td>
<td>5.32 W</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Special Conditions for Safe Use (X):

1. See certificate for special condition.

China

I3 China Intrinsic Safety
Certificate: NEPSI GYJ13.1135X
Markings: Ex ia IIC T4 Ga

<table>
<thead>
<tr>
<th></th>
<th>Ui</th>
<th>li</th>
<th>Pi</th>
<th>Ci</th>
<th>Li</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entity parameters</td>
<td>30 V</td>
<td>300 mA</td>
<td>1.3 W</td>
<td>2.1 nF</td>
<td>1.1 μH</td>
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<tr>
<td>FISCO parameters</td>
<td>17.5 V</td>
<td>380 mA</td>
<td>5.32 W</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>
Special Conditions for Safe Use (X):

1. See certificate for special condition.

Technical Regulations Customs Union (EAC)

IM  EAC Intrinsic Safety
Certificate: RU C-SE.AA87.B.00348
Markings: 0Ex ia IIC T4 Ga X
Ta = -50 °C to +70 °C
IP66, IP67

Japan

I4  Japan Intrinsic Safety
Certificate: CML 17JPN2203X
Markings: Ex ia IIC T4 Ga ; FISCO (-50 °C ≤ Ta ≤ +70 °C)

Republic of Korea

IP  Korea Intrinsic Safety
Certificate: KTL 11-KB480-0073X
Markings: Ex ia IIC T4 (-50 °C ≤ Ta ≤ +70 °C)

Additional Certifications

India Intrinsic Safety
Certificate: P38880/1
Markings: Ex ia IIC Ga T4
Dimensional Drawings

Figure 1. Rosemount 2230 Graphical Field Display

Dimensions are in millimeters (inches).
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