

# Centeron<sup>®</sup> Intrinsically Safe Digital Propane Monitor Instruction Manual

Model # DG-IS-GPS Series

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## 1.0 Introduction

This manual describes how to install, test, and service the Centeron® Digital Propane Monitor Series (hereafter referred to as the DG). The DG is part of the Centeron® Level Monitoring System, which includes Centeron® WebView (hereafter referred to as WebView) Internet data and device configuration access.

This guide does not include the detailed operation of WebView. Refer to the Internet help screens for this information.

The description herein is based on a standard installation.

## 2.0 Product Overview

### 2.1 Description

The DG is a battery-powered unit that measures and transmits tank level, device temperature, and other status information to WebView for display to the customer. The DG can be configured in the field using WebView. The DG uses a digital cellular modem to transmit and receive data.

### 2.2 Operation

The DG uses a scheduler to determine when to make level measurements. The DG transmits information to WebView Based on the device's schedule and any alarm conditions that are detected. WebView further processes the data and displays it on the Internet. WebView can be configured to send alerts to users via e-mail, text message, or fax.

#### 2.2.1 Measurement Operation

The DG connects to a sensor that detects the position of the pointer in a level indicator dial on the tank. By comparing the sensor input and output voltages the Monitor is able to determine the percent volume of liquid inside the tank. WebView uses this data along with the tank dimensions to calculate the amount of product that is in the tank.

A tank level measurement is made each time the DG reports to WebView. The DG also measures and reports battery voltage, cellular signal strength, and temperature inside its enclosure. WebView interprets the reported data to provide the user with tank level, communication link quality, and battery condition information. Level measurements are also made at regular intervals between reporting times to determine if the tank level has crossed any setpoints. The DG can be configured to make unscheduled transmissions in response to setpoint crossings.

#### 2.2.2 Scheduler Operation

The DG has a scheduler that allows the user to configure:

- Daily or weekly reporting,
- Number and time of reports per day or week, and
- How frequently to perform extra measurements between transmissions.

The user can configure the schedule using WebView. Please refer to the online help screens if you have any questions regarding the configuration of the DG.

### 2.2.3 Data Transmissions

The DG will transmit data on a preset schedule, on an alarm condition, or when the disable magnet is removed from its slot in the enclosure.

#### 2.2.3.1 Regularly Scheduled Transmissions

All transmission scheduling is configurable from WebView. Internal timekeeping allows the user to specify the times for transmissions to within approximately 15 minutes. The schedule can be set from once per hour (maximum of 24 transmits per day) to once per week. Measurements will be performed just before regularly scheduled transmissions.

**IMPORTANT NOTE: The DG battery life has been optimized for a schedule of three cellular transmissions per day with intermediate level measurements every hour. Changing the DG schedule will affect unit battery life.**

#### 2.2.3.2 Alarm Transmissions

The DG will transmit immediately upon detecting an alarm condition. WebView can be configured to send e-mail alerts whenever it receives an alarm from the DG. Please refer to Section 2.2.4 for more detail.

#### 2.2.3.3 Forced Transmissions

Whenever the disable magnet is removed from the housing, the DG will take a measurement and transmit within minutes.

### 2.2.4 Alarm Operation

The DG provides flexible alarm capabilities for level Setpoints and Fill Alerts. These alarms can be configured using WebView. When an alarm condition occurs the DG will immediately transmit to WebView. WebView can be configured to send alert messages whenever an alarm condition is reported by the DG. Alarm functions cause the DG to make additional level measurements and cellular transmissions, which may affect battery life and call usage.

#### 2.2.4.1 Level Setpoint Alarm

The DG provides two level setpoints. The user can configure the setpoints to alarm as the level is increasing, decreasing, or passing the setpoint in either direction. The user can configure a deadband around each setpoint to avoid unnecessary calls.

#### 2.2.4.2 Fill Alert Alarm

The DG is programmed to report tank fills. When a substantial fluid level increase is detected the DG makes a special transmission to report both the pre-fill and post-fill tank levels. WebView can be configured to send an e-mail alert message whenever a Fill Alert is reported by the DG. Unscheduled Monitor transmissions resulting from Fill Alerts can be prevented by disabling the Fill Alert feature in WebView.

#### 2.2.5 Cellular Network Operation

The DG transmits its data on a standard digital cellular network using many cellular providers. As with all cellular devices, coverage includes most of the United States, Canada, and Mexico. If you have any issues regarding the DG communicating with WebView, please contact Robertshaw Technical Support (See Section 6.3). They may be able to provide information regarding any network issues in the area where the device is located.

### 2.3 Environmental Specifications

The following environmental specifications should be observed when installing the DG:

- Temperature Range: -30°C to +75°C
- Designed for indoor or outdoor use
- Type 4X enclosure

### 2.4 Certifications

#### 2.4.1 FCC Notice—Radio Frequency Communications

The DG generates and uses radio frequency energy. If not installed and used in accordance with the manufacturer's instructions, it may cause interference to radio and television reception. The DG has been tested and found to comply with the specifications in Part 15 of Radiators and FCC Rules for Class B Computing Devices.

**CAUTION:** Robertshaw Industrial Products does not support field changes or modifications to any of the Centeron® Level Monitoring System equipment unless they are specifically covered in this manual. All adjustments must be made at the factory under the specific guidelines set forth in our manufacturing processes. Any modification to the equipment will void the manufacturer's warranty and could void the user's authority to operate the equipment and render the equipment in violation of FCC Part 15, Subpart C, 15.247.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

**2.4.2 Canada**

This Class B digital apparatus complies with Canadian ICES-003.  
Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

**2.4.3 Safety and Regulatory**

The DG is designed to comply with UL Standards for Intrinsically Safe Apparatus for use in Class I, II, and III, Division 1, Hazardous (Classified) Locations. The Monitor conforms to UL 913, 7<sup>th</sup> Edition and has been certified to CAN/CSA Standard C22.2 No. 157, Non-Incendive Equipment for Use in Hazardous Locations.

**WARNING: SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY.**

**AVERTISSEMENT: LA SUBSTITUTION DE COMPOSANTS PEUT COMPROMETTRE LA SÉCURITÉ INTRINSÈQUE.**

**2.4.4 Marking**

The DG Nameplate and Warning Label provide the following information:

<b>Centeron®</b>		by <b>Robertshaw®</b>		
<b>S/N:</b>	<b>C20GGXXXX</b>		2002027	
<b>MODEL:</b>	<b>MONITOR - DGXXXX-X-IS-XXX - REV X</b>			
<b>FCC ID:</b>	<b>09EWMP100</b>	<b>FC</b>	<b>Canada: 3651C-WMP100</b>	
	<b>HW VER: 1.0</b>	<b>SW VER: 1.0</b>		

**Intrinsically Safe Apparatus for Use in Class I Division 1 Group D Hazardous Locations.**

**Class I Zone 0**  
**AEx ia IIA T3**  
**-30°C ≤ Ta ≤ +70°C**  
**Enclosure Type 4X**

Conforms to UL Std. 913  
Certified to CAN/CSA Standard C22.2 No. 157

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference and (2) This device must accept any interference received, including interference that may cause undesired operation.

Made in USA under the following U.S. Patents:  
6,994,305, 7,298,278, 7,298,281.

Patents Pending in the U.S. and other countries.

**Robertshaw Industrial Products**  
1602 Mustang Drive  
Maryville, TN 37801 USA  
[www.centeron.net](http://www.centeron.net) 1-865-981-3100

**i n v e n t o r y s**  
Controls  
MM/DD/YY

**WARNING - SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY.**  
**AVERTISSEMENT - LA SUBSTITUTION DE COMPOSANTS PEUT COMPROMETTRE LA SECURITE INTRINSEQUE.**

**WARNING - POTENTIAL ELECTROSTATIC CHARGING HAZARD. DO NOT RUB WITH A DRY CLOTH. SEE INSTRUCTIONS.**  
**AVERTISSEMENT - RISQUE DE CHARGE ÉLECTROSTATIQUE. NE PAS FROTTER AVEC UN TISSU SEC. VOIR LES INSTRUCTIONS.**

**WARNING - USE ROBERTSHAW BATTERY REPLACEMENT KIT "E" (086662E0001) ONLY.**  
**AVERTISSEMENT - UTILISEZ UNIQUEMENT LE KIT DE PILES DE RECHANGE ROBERTSHAW "E" (086662E0001).**

**INTRINSICALLY SAFE DEVICE**  
**SECURITE INTRINSEQUE Ex ia IIA**

**SEE INSTRUCTION MANUAL FOR ADDITIONAL INFORMATION.**  
**VOIR LE MODE D'EMPLOI POUR DE PLUS AMPLES INFORMATIONS.**

**REFER TO CONTROL DRAWING 039976B0001.**

### 3.0 Installation

A list of the provided equipment and additional tools required for installation can be found in the Installation Guide that was included with this product.

**NOTE: The DG should be configured in WebView prior installation and activation.**

#### 3.1 Handling Guidelines

**Warning: Tanks may contain flammable liquid or vapor, extinguish all flames and smoking material before performing the Monitor installation procedure.**

**Warning: Electrostatic discharge precautions:**

1. To minimize the risk of an electrostatic spark occurring in the hazardous area, ground yourself to the tank before installing the Monitor.
2. Do not rub the Monitor housing with a dry cloth.

The DG is designed to provide many years of reliable service in demanding outdoor environments. However, the device contains sensitive measurement circuitry and should be handled carefully. Do not throw or drop the Monitor. Do not attempt to disassemble the Monitor.

#### 3.2 Mounting

**WARNING - The DG must be installed to provide a separation distance of at least 20 cm from all persons and must not be collocated or operating in conjunction with any other antenna or transmitter.**

**NOTE: For optimal performance, avoid mounting multiple cellular products within two feet of each other.**

##### 3.2.1 Mounting Step 1

Remove the Monitor and sensor from their protective packaging.

Install the Propane Monitor sensor on the tank level indicator dial. Most new tanks have a Remote Ready dial with a small black plastic tab on its face. Remove this tab by lifting the outer edge and sliding it away from the center of the dial. Slide the Propane Monitor sensor module into the slot where the tab was removed and snap it securely into position.

If the tank is NOT equipped with a Remote Ready dial then replace the existing level indicator dial with the appropriate Remote Ready dial. Install the Propane

Monitor sensor on the new Remote Ready dial as described in the previous paragraph.

**Warning: If a level indicator dial must be replaced, remove only the small plastic dial. Do not attempt to remove the dial mounting base or float assembly - severe injury could result.**

Compare the new dial reading with the estimated tank contents. If the new dial reading is not correct, remove the dial and rotate the pointer to approximate the expected dial reading (using a magnet near the back of the dial). Reinstall the dial. If the reading still seems incorrect, the indicator dial may be the wrong type.

**Warning: Improper dial selection or application may result in inaccurate gauge reading. Release of tank contents as well as damage to equipment and safety hazard may result if the tank is overfilled. Fuel exhaustion may occur if the tank contents are less than indicated. The Centeron Level Monitoring System is not a substitute for a fixed liquid level gauge or weight measurement device, which may be required for filling.**

##### 3.2.2 Mounting Step 2

If the level indicator dial is located under the tank dome, use the supplied nylon wire tie to secure the sensor wire to the feed tube or other object in order to prevent the dome lid from damaging the wire when it is closed.

##### 3.2.3 Mounting Step 3

Generously apply the supplied dielectric grease to the three electrical terminals inside the Monitor housing socket. Insert the sensor wiring harness connector into the Monitor housing socket and snap it firmly into position.

##### 3.2.4 Mounting Step 4

Carefully attach the DG to the top of the tank outside of the dome lid. A large magnet in the base will hold the Monitor in place on a smooth area of the tank. Rotate the Monitor slightly to position it in the most stable orientation on the tank.

#### 3.3 Activation

Following installation, the unit can be activated. To activate the Monitor, pull the external slide magnet completely out of the top of the Monitor housing. This will activate the Monitor to make measurements and radio transmissions on a programmed interval (per customer configured schedule in WebView).

*Note: Do not discard the magnet completely—keep it accessible for future use if needed. Do not store the magnet in the Monitor upper housing slot since this will de-activate the Monitor.*

Once the external slide magnet is removed from the Monitor, the DG will take a measurement and send this data to WebView within a few minutes. If the installer's cell phone is available and active with its email address set up in WebView to receive "Alert on Data" messages, a successful installation text message should be received within several minutes. If the installer's Cell Phone is not configured to receive data notification text messages, the installer could contact someone at his company who has access to WebView for verification that Monitor data has been received.

## 4.0 Troubleshooting

If the DG is not operating properly, locate the solution below:

### Issue

Installer didn't receive a confirmation text message when magnet was pulled from unit.

When looking at WebView, configuration data wasn't sent when a magnet pull was done.

All installation and activation instructions have been followed completely, but the DG will not report valid information to WebView.

### Resolution

Verify that installer's e-mail address was set up on WebView to receive notification when data is sent.

See if "Downloaded" checkbox is checked. If so, configuration has already been downloaded.

Call Robertshaw Technical Support. (See Section 6.3)

## 5.0 Battery Replacement

The DG is self-contained and operates on a specially designed battery pack, which should only be replaced by qualified service personnel. Detailed battery replacement instructions are included with each Battery Replacement Kit.

CAUTION: Use Robertshaw 086662E0001 Battery Replacement Kit only.

## 6.0 Warranty and Service

### 6.1 Warranty

Seller warrants title and that products sold to Buyer shall be free from defects in material and workmanship and shall conform to specifications for a period of one (1) year from purchase date for complete units and parts and subassemblies.

Warranties on goods sold but not manufactured by the seller are expressly limited to the terms of warranties of the manufacturer of such goods.

Seller makes no representation or warranty of any kind, express or implied, as to merchantability, fitness for particular purpose or any other matter. Upon receipt of definite shipping instructions, Buyer shall return, transportation prepaid, all defective material, or material not conforming to specifications, to Seller, after inspection by Seller, or at Seller's election, subject to inspection by Seller. Material returned by Buyer must be returned in same condition as when received by Buyer. Defective material, or material not conforming to specifications, so returned shall be replaced or repaired by Seller and returned, freight prepaid, without any additional charge, or in lieu of such replacement or repair, Seller, may, at Seller's option, refund the purchase price applicable to such material. Seller agrees to pay return freight charges not exceeding the lowest rail or truck rate which would apply from the original destination on all defective material, or material not meeting specifications. However, Seller shall not be obligated for such charges when material returned proves to be free from defect and to meet specifications. Material which proves to be free from defect and to meet specifications shall be held by Seller for shipping instructions and Buyer shall furnish such instructions promptly upon request. Seller's liability shall be limited solely to the replacement or repair or to refunding the purchase price applicable to the defective material or material not meeting specifications. Seller shall not be liable for any consequential damages nor any loss, damages or expenses directly or indirectly arising from the use of the material.

### 6.2 Unit Disposal

The U.S. Environmental Protection Agency regulates the disposal of waste products in the United States. The EPA Regulations are listed in the "Code of Federal Regulations," CFR40, entitled "Protection of Environment." Additionally, individual states and local communities also may establish more stringent regulations covering the disposal of waste products. Thus, state and local agencies should be contacted for their disposal guidelines.

### 6.3 Service and Technical Support

If you experience trouble with this equipment, please contact **Robertshaw Industrial Products Technical Support at (865) 981-3118, Monday through Friday, EST 8:00 a.m. to 4:30 p.m.**

**This unit is to be serviced by qualified service personnel only.**

## 7.0 Control Drawing

REV.	DATE	DESCRIPTION	SCALE
A	1662P	RELEASE FOR PRODUCTION	1/8"
B	1665E	NOTE 5A DOXXXX-X-IS-XXX WAS REMOVED NOTE 6 ADDED NOTE 7 ADDED	1/8"
C	1674E	NOTE 5A AND 6 ADDED	1/8"

1. WHEN INSTALLED AS SHOWN THE MONITOR AND GAUGE ARE INTRINSICALLY SAFE FOR HAZARDOUS LOCATION CLASS 1, DIVISION 1, GROUP D.
2. INTRINSICALLY SAFE WIRING MUST BE INSTALLED IN ACCORDANCE WITH ARTICLE 504 OF THE NEC ANSI/NFPA 70 OR, IF APPLICABLE, WITH THE CANADIAN ELECTRICAL CODE.
3. MONITOR AND GAUGE SHALL BE INSTALLED IN ACCORDANCE WITH GAUGE MONITOR INSTALLATION INSTRUCTIONS.
4. GAUGE, ROCHESTER GAUGES 0 TO 10,000 OHM TWINITE SENDER OR ROCHESTER GAUGES HALL EFFECT SENSOR.
5. MONITOR, ROBERTSHAW INDUSTRIAL PRODUCTS DOXXXX-X-IS-XXX OR DXXXXX-X-IS-XXX SERIES GAUGE MONITOR.
6. USE MANUFACTURER SUPPLIED 066662 SERIES 7.2 V BATTERY PACK ONLY. SEE MONITOR LABEL FOR SPECIFIC BATTERY REPLACEMENT KIT PART NUMBER.
7. WARNING: SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY. AVERTISSEMENT: LA SUBSTITUTION DE COMPOSANTS PEUT COMPROMETTRE LA SECURITÉ INTRINSÈQUE.

INDUSTRIAL PRODUCTS DIVISION  
AN INVENSYS COMPANY

039976B0001

DIGITAL CELLULAR GAUGE  
MONITOR CONTROL DRAWING

039976B0001

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U.S. PATENT 6,994,305 7,298,278 7,298,281

ROBERTSHAW INDUSTRIAL PRODUCTS  
1602 MUSTANG DRIVE, MARYVILLE, TENNESSEE 37801  
TEL: 865-981-3100 FAX: 865-981-3168  
WWW.ROBERTSHAW.COM

SPECIFICATIONS ARE VARYING AND MAY BE SUBJECT TO CHANGE WITHOUT NOTICE

DATE: 11/12/03

DRAWN BY: J. W. HARRIS

CHECKED BY: J. W. HARRIS

APPROVED BY: J. W. HARRIS

SCALE: 1/8"

SHEET: 1 OF 1



i n v e n s y s

Controls

U.S.A. – Robertshaw Industrial Products Division, 1602 Mustang Drive, Maryville, Tennessee 37801  
865-981-3100 • Fax: 865-981-3168  
[www.Centeron.net](http://www.Centeron.net)

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