

6318 Jr Wireless Dial

Remote-read BLE output sensors for use with existing ASME Tanks and DOT Cylinders



The 6318 Jr Wireless Dial provides a wireless connection between a gauge and the corresponding telemetry system. The self-contained dial reads from the gauge in the tank and broadcasts via a Bluetooth Low Energy (BLE) output to a telemetry system. The display of the dial is activated by tapping the sensor housing.

The dial is designed to support a 10-year battery life. The 6318 Jr Wireless Dial can be replaced at the end of the service interval.

The wireless operation simplifies installation and eliminates any issues with cable connection and subsequent damage during operation. The device conforms to similar intrinsic safety requirements as the 9700 Series Modules: Class 1 Div 1 for IECEx/ATEX/UKEX/CSA.

The 6318 Jr Wireless Dial is compatible with Rochester Sensors standard 1.5" gauges including medium-duty spiral gauge. It is available in both a snap-on and screw-on versions to replace existing direct read and R3D junior dials.

Application

The 6318 Jr Wireless Dial acquires level readings from a tank on 15 minute intervals. The sensor broadcasts via BLE every 2.2 seconds. This transmission occurs automatically and does not require pairing. The local LCD can be activated by tapping the housing. This will cause the device to take a reading and display the result for 10 seconds before turning the display off. A built-in delay before re-activating the display conserves power by ignoring false tapping inputs.

General Information and Features

- Nylon housing offers excellent mechanical properties and chemical resistance
- No exposed sensing elements, all components are located on the PCB inside the housing
- Ingress Protection: IP67 / IP69K rated
- Additional EMI/RFI Specifications TBD.
- Over-the-air firmware update capability

Key Benefits

- No exposed cables
- Fast installation time
- Easy to read digital display shows tank volume in 1% increments
- Rugged plastic housing
- Fully sealed
- Field replaceable at end of lifetime



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LCD Status Indicators

The 6318 sensor is equipped with a 2-digit 7-segment LCD display. The LCD will show status codes to indicate different conditions. Some status codes are considered errors while some are considered warnings and will affect the level value system wide. Refer to each code for an expected behavior. Refer to Appendix A for all system errors and warnings.



bL: Battery low. Battery is estimated to be within 1-2 years of expected end of life. The measured level will alternate on the LCD with this code.



bC: Battery critical. Battery is estimated to be < 1 year of expected end of life. The measured level will alternate on the LCD with this code.



Er: Device error. Device is not functioning correctly and electronics should be replaced. The level will be set to 0% and alternate with this code.



Lo: Low or Low-Low Warning. Tank level is below expected operating range.



Hi: High or High-High Warning. Tank level is above expected operating range.

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Broadcast Protocol

PACKET TYPE 0x0101 - PRIMARY TELEMETRIC PACKET 2.2sec INTERVAL

Bytes	Payload Contents	
0	Flag 0	BLE Protocol Specified
1	Flag 1	BLE Protocol Specified
2	Flag 2	BLE Protocol Specified
3	Length	0x14
4	Type Flag (FF)	Manufacturer Specific Data
5	MM - company id from bluetooth.com	0x0C (Company ID from Bluetooth.org)
6	MM - company id from bluetooth.com	0x7F (Company ID from Bluetooth.org)
7	Byte 1 RS device name	R
8	Byte 2 RS device name	O
9	Byte 3 RS device name	S
10	Byte 4 RS device name	0x63
11	Byte 5 RS device name	0x18
12	0x01 (identification of content type)	LSB
13	0x01 (identification of content type)	MSB
14	Status	See status table
15	RAW DATA TYPE	0x00 = %
16	RAW DATA LSB ¹	
17	RAW DATA MSB ¹	
18	Reserved	
19	Battery LSB	% Remaining = (MSB LSB)/(0xFFFF)
20	Battery MSB	
21	Reserved	
22	Reserved	
23	Version	Valid range: 0x0A – 0x0F

Note 1. Possible ranges are 3% to 97% in 0.1% per bit increments

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Product Certification

Rochester Sensors 6318 Jr Ble Dial is certified as intrinsically safe for class 1, Division 1, Groups C & D hazardous locations. Products are marked and approved by ETL, ATEX, UKCA, and CE.

Hazardous Locations Safety Standards

IEC 60079-0: 2017	Explosive atmospheres – Part 0: Equipment – General requirements *Note: For IECEx Certification
EN 60079-0: 2011 + C1: 2012	Explosive atmospheres – Part 11: Equipment protection by intrinsic safety “i” *Note: For IECEx Certification
EN 60079-0: 2018	Explosive atmospheres – Part 0: Equipment – General requirements *Note: For ATEX Certification
EN 60079-0: 2012	Explosive atmospheres – Part 11: Equipment protection by intrinsic safety “i” *Note: For ATEX Certification
UL 60079-11, 6th Ed., Issued 03/26/2019	Explosive atmospheres – Part 0: Equipment – General requirements *Note: For USA listing Certification
UL 60079-11, 6th Ed., Revised 03/28/2014	Explosive atmospheres – Part 11: Equipment protection by intrinsic safety “i” *Note: For USA listing Certification
CSA C22.2 No. 60079-0: 2011	Explosive atmospheres – Part 0: Equipment – General requirements *Note: For Canada listing Certification
CSA C22.2 No. 6009-11: 2011	Explosive atmospheres – Part 11: Equipment protection by intrinsic safety “i” *Note: For Canada listing Certification

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Environmental Ratings

Parameter	Condition	Min	Typical	Max	Unit
Operating Temperature Range	Temperature Range	-40	-	80	°C
Module Accuracy		-	<1%	-	Level
UV withstand	600 hrs, UVA-340 @.76W/m2, 70°C	-			
Vibration	Mil STD-810: 5 Hz, 12.7mm Amplitude, 1G, 45 minutes				

Dimensions

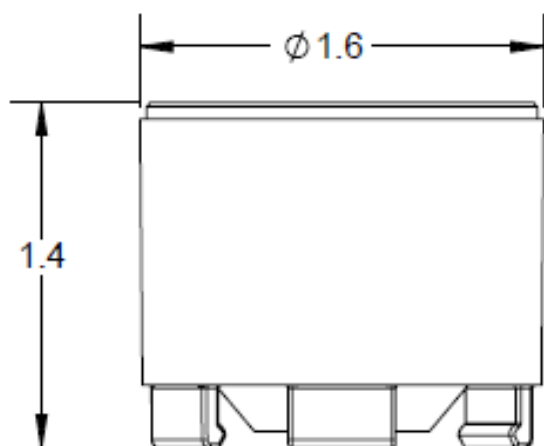


Figure 2. Snap-on unit

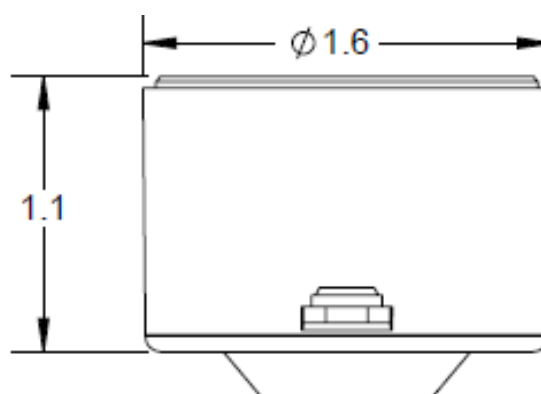


Figure 1. Screw on Unit

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Ordering Information

Contact your local sales representative for samples, availability, and pricing information.

Part Options:

Part Number	Model
6318-01001	BLE Magnetic Dial, Vertical Tank, Bluetooth, Screw-on
6318-01002	BLE Magnetic Dial, Horizontal Tank, Bluetooth, Screw-on
6318-01003	BLE Magnetic Dial, Fractional, Bluetooth, Screw-on
6318-02001	BLE Magnetic Dial, Vertical Tank, Bluetooth, Snap-On
6318-02002	BLE Magnetic Dial, Horizontal Tank, Bluetooth, Snap-on
6318-02003	BLE Magnetic Dial, Fractional, Bluetooth, Snap-on
8318-02011	BLE Magnetic Dial, Spiral Gauge, Bluetooth, Snap-on

Installation

See Document DS-02041

As per 47 CFR §15.21

The user's manual or instruction manual for an intentional or unintentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. In cases where the manual is provided only in a form other than paper, such as on a computer disk or over the Internet, the information required by this section may be included in the manual in that alternative form, provided the user can reasonably be expected to have the capability to access information in that form.

RF Exposure warning statements:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. End users must follow the specific operating instructions for satisfying RF exposure compliance. This transmitter must be at least 20 cm from the user and must not be co-located or operating in conjunction with any other antenna or transmitter.

The information in this guide may change without notice. The manufacturer assumes no responsibility for any errors that may appear in this guide.

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FCC Interference statement (Part 15.19)(a)(3)

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.

FCC Interference Statement — PART 15.105 (B)

Note:

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

ISED Canada compliance statement

This device complies with ISED Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'ISDE Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

RF Exposure Statement:






Radiation Exposure Statement: This equipment complies with the IC RSS-102 radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 cm between the radiator and your body.

Énoncé d'exposition aux rayonnements: Cet équipement est conforme aux limites d'exposition aux rayonnements ioniques RSS-102 Pour un environnement incontrôlé. Cet équipement doit être installé et utilisé avec un Distance minimale de 20 cm entre le radiateur et votre corps.

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Appendix A

<i>System Conditions</i>	<i>BLE STATUS BYTE</i>	<i>BLE BROADCAST LEVEL</i>	<i>LCD OUTPUT</i>	<i>Description</i>
Normal	0x0	Level	Level	Normal Operation
Tank Level < 5%	0x2	Level		Measurement Low Low Warning <ul style="list-style-type: none"> LCD displays static "Lo"
Tank Level < 10%	0x6	Level	Alt Level + "Lo"	Measurement Low Warning <ul style="list-style-type: none"> LCD displays alternating "Lo" and Level
Tank Level > 85%	0x7	Level	Alt Level + "HI"	Measurement High Warning <ul style="list-style-type: none"> LCD displays alternating "HI" and Level
Tank Level > 95%	0x3	Level		Measurement High High Warning <ul style="list-style-type: none"> LCD displays static "HI"
Device Error	0x1	Level		Er: Device error. Device is not functioning correctly and electronics should be replaced. The level will be set to 0% and alternate with this code.
Battery Low	0x0	Level		bL: Battery low. Battery is estimated to be within 1-2 years of expected end of life. The measured level will alternate on the LCD with this code plus any level warning codes (if any)
Battery Critical	0x0	Level		bC: Battery critical. Battery is estimated to be < 1 year of expected end of life. The measured level will alternate on the LCD with this code plus any level warning codes (if any)

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SCHEDULED DRAWING
Revision A, 12 Dec 2023

Customer Service, Toll Free (888) 723-5549
Rochester Sensors LLC
1025 S Belt Line Rd
Coppell, TX 75019

6318 BLE Dial Magnetic Sensor

DS-02041

The 6318 BLE Dial Magnetic sensor provides a wireless reading of a Rochester Mechanical Sensor installed in a tank. The unit replaces the normal dial and optional R3D electronics module with a new BLE Dial that broadcasts tank volume over Bluetooth. An integrated LCD display shows tank volume in % full.

The unit is battery operated and fully sealed. It replaces an existing dial, either screw-on or snap-on and contains no serviceable parts inside.

The Sensor is suitable for field applications including high pressure washing systems.

General Information & Features

- Temp Range Static: -40°C to +80°C / -40°F to +176°F
- Ingress Protection: IP67 / IP69K Rated
- System Accuracy: +/- 2%
- LCD display
- Bluetooth data broadcast every 2.2 seconds
- Operational Life Span: Up to 10 Years
- Operational Range: Over 50FT
- See SD-587 for entity parameters.

Sensor Installation Instructions

These instructions are made to assist tradesmen and others generally familiar with liquid storage tank equipment. Most consumers are not qualified to perform the installation described herein. If you have any question concerning installation or operation of this product, contact Rochester Sensors LLC or one of our authorized distributors for assistance.

1. Remove the existing dial and any connected electronics module. Dispose of according to location standards for metal and electronic disposal.

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2. Remove the BLE Dial from the shipping container.
3. Before installing the new BLE dial, clean the head of any foreign debris or liquids.
4. For snap-on dials, position the BLE Dial's alignment key over the slot on the gauge head. Gently press into place until all four latching tabs snap onto the existing gauge head.
5. For screw-on dials, align the round and rectangular ends of the new BLE Dial housing with the existing sensor. Install the screws, tighten to 2 in-lb with hand tools only.
6. Verify the LCD is reading the appropriate level.
7. The installer may optionally verify the BLE dial is broadcasting over Bluetooth. Refer to the Manufacturer's instructions on parsing BLE broadcast packets.
8. Equipment is intended for fixed and grounded installation only.

Design

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WARNINGS:

Tank may contain high pressure and flammable gas.

These units are not meant to be repaired or serviced. Doing so will void the intrinsically safe rating of the device.

The product is a sealed unit and is never meant to be opened or modified in any way. Doing so will invalidate all certifications and safety listings.

Safety Specifications

- **WARNING - POTENTIAL ELECTROSTATIC CHARGING HAZARD**

Caution must be used when handling or cleaning products so there is no static charge buildup. Do not wipe off the 6318 BLE Dial with dry cloth. Use only water damp cloth and allow to air dry for cleaning device. Do not use or install in high charge areas. See IEC60079-32-1 for further information.

- **AVERTISSEMENT - RISQUE DE CHARGE ÉLECTROSTATIQUE POTENTIEL**

Il faut être prudent lors de la manipulation ou du nettoyage des produits afin qu'il n'y ait pas d'accumulation de charge statique. N'essuyez pas le capteur avec un chiffon sec. Utilisez uniquement un chiffon humide et laissez sécher à l'air pour nettoyer l'appareil. Ne pas utiliser ou installer dans des zones de charge élevée. Voir IEC 60079-32-1 pour plus d'informations.

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Ordinary Locations Safety Standards	
Conforms to UL STD 61010-1 Ed. 3	Electrical Equipment for Measurement, Control, and Laboratory Use; Part 1: General Requirements *Note: For USA ordinary locations listing certification
Certified to CSA STD C22.2 #61010-1-12 Ed.3	Electrical Equipment for Measurement, Control, and Laboratory Use; Part 1: General Requirements *Note: For Canada ordinary locations listing certification
Hazardous Locations Safety Standards	
IEC 60079-0: 2017	Explosive atmospheres - Part 0 Equipment - General requirements *Note: For IECEx Certification
IEC 60079-11: 2011 + C1: 2012	Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i" *Note: For IECEx Certification
IEC 60079-25: 2010 Ed 2.	Explosive atmospheres - Part 25: Intrinsically safe electrical systems *Note: For IECEx Certification
EN 60079-0: 2018	Explosive atmospheres - Part 0: Equipment - General requirements *Note: For ATEX Certification
EN 60079-11:2012	Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i" *Note: For ATEX Certification
IEC 60079-25: 2010 Ed 2.	Explosive atmospheres - Part 25: Intrinsically safe electrical systems *Note: For ATEX Certification
Conforms to UL 60079-0, 7 th Ed.	Explosive atmospheres - Part 0: Equipment - General requirements *Note: For USA listing certification
Conforms to UL 60079-11, 6 th Ed.	Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i" *Note: For USA listing certification
Certified to CSA C22.2 No. 60079-0: Ed. 4	Explosive atmospheres - Part 0: Equipment - General requirements *Note: For Canada listing certification
Certified to CSA C22.2 No. 60079-11: Ed. 2	Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i" *Note: For Canada listing certification

Rochester Sensors, LLC BLE Magnetic Sensor does not require any external connections or sources of power. The Sensor device is certified as complete intrinsic safety system (Reference Intrinsic Safety Control Drawings SD-587). Device is intended for use in Class 1, Division 1, Groups C and D, T4 or Zone 0, Group IIB, T4 Hazardous Locations under the certification schemes and ratings noted below:

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<i>IECEx (Global Certification):</i>	<i>ATEX (EU Certification):</i>	<i>North America (USA & Canada):</i>	<i>United Kingdom (UK):</i>
Ex ia IIB T4 Ga	CE ₂₅₇₅  II 1G Ex ia IIB T4 Ga	Class 1 Zone 0 AEx ia IIB T4 Ga Class 1, Division 1, Groups C & D, T4 Ex ia IIB T4 Ga -40°C ≤ T _{AMB} ≤ +80°C	UKCA ₀₃₅₉  II 1G Ex ia IIB T4 Ga
-40°C ≤ T _{AMB} ≤ +80°C	-40°C ≤ T _{AMB} ≤ +80°C		-40°C ≤ T _{AMB} ≤ +80°C
IECEx Cert # IECEx ETL 23.0060X	ATEX Cert # ETL23ATEX0359X	CSA Cert # ETL23CA105206098X	UKEX Cert # ITS23UKEX0794X

Intrinsic Safety System Level Verification

Model	BLE Magnetic Sensor Entity Parameters
Equipment Group	Groups C&D (Group IIB)
Level of protection	Ex ia
Temperature Classification	T4
Ambient Temperatures	-40°C to +80°C
Parameter Comparison	
Voltage	Ui: N/A
Current	Ii: N/A
Power	Pi: N/A
Capacitance	Ci: N/A
Inductance	Li: N/A
L/R Ratio	N/A
Earthing	N/A

CE Compliance section:

A. Electromagnetic Compatibility

- EN 61000-6-2:2005 - Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments IEC 61000-6-2:2005
- EN 61000-6-4:2007 - Electromagnetic compatibility (EMC) - Part 6-4: Generic standards - Emission standard for industrial environments IEC 61000-6-4:2006

B. Restriction of hazardous substances in electrical and electron equipment

Status:	Design	ID:	DS-02041-Scheduled_Drawing	Revision:	A-0
Date:	2023/08/02	Unique Rev:	1	Description:	INSTALLATION GUIDE, 6318 BLE DIAL scheduled drawing
		Doc Type:	Data Sheet	Department:	

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1. EN 50581:2012 - Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances.

Special Conditions of use:

1. Equipment is intended for fixed and grounded installation only
2. Potential Electrostatic Charging Hazard – see instructions.

Design