TEK 871 Cellular Ultrasonic Exi

Our Intrinsically safe TEK 871 Cellular Ultrasonic Exi (C1D1) is a flexible and configurable battery-operated liquid level sensor with an integrated Cellular modem supporting GSM (2G), LTE-CAT-M1/NNB-IoT networks and GPS.

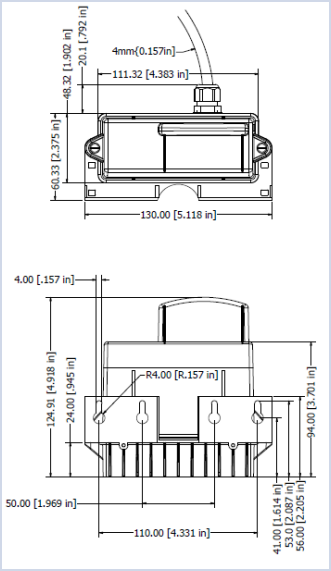
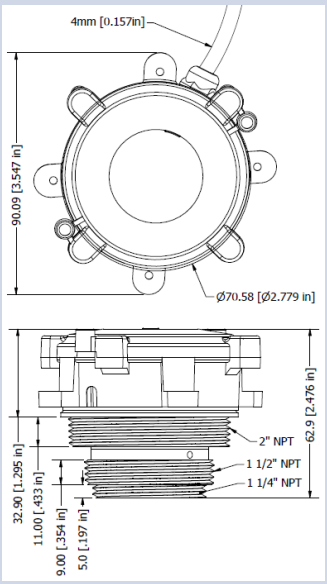
Applications

- Liquid Level Ultrasonic level sensor
  - Fuel - oil, Kerosene, Diesel
  - Lubricants
  - Additives
  - Other hazardous/non hazardous
  - DEF / Adblue
  - Coolants
  - Water
  - Waste Oil
  - Wastewater
  - Chemicals - **This product may not be suitable for monitoring of certain corrosive and hazardous chemicals. List of product compatible chemicals to be verified with a Tekelek representative.*
- Fixed, portable and underground tanks
- Ensure continued supply
- Optimise delivery or collections
- Spot and continuous inventory measurement

Benefits

- Accurate, reliable tank level monitoring
- Programmable data reporting interval
- Remote configurability
- 28 slot logger with configurable logging interval
- Easy to install
- International Approvals
- Programmable alarms
  - Full alert
  - Empty alert
  - Spill alert (bunded tanks)
  - Fill alert
  - Low and High levels
  - 24/7 Monitoring
- Reports local temperature, radio signal strength, and battery level
- External antenna option for underground locations
- Mounting/attachment options – wall/pole

Rochester Sensors
Engineering Innovative Solutions™

Characteristics	Liquid Level logger LTE CAT-M1/NB-IoT /2G	Ultrasonic level sensor Exi
Dimensions		
Safety	Class I, Div 1, Gr A D T4 Class I, Div 1, Gr C D T4 Class I Zone 0 AEx ia IIB T4 Ga Class I Zone 0 AEx ia IIC T4 Ga SGSNA/22/CA/00014X BA22UKEX0189X II 1G Ex ia IIC T4 Ga Ta = -30°C to +55°C II 1G Ex ia IIB T4 Ga Ta = -30°C to +55°C II 1G Ex ia IIC T4 Ga Ta = -30°C to +50°C II 1G Ex ia IIB T4 Ga Ta = -30°C to +50°C SGS22ATEX0060X & IECEx BAS 22.0034X Complies with UL 913	Class 1, Div 1, Group A,B,C & D T4 Class I, Zone 0 AEx ia IIC T4 Ga Complies with UL 913 SGSNA/20/CA/00003X SGS20ATEX0009X IECEx BAS 20.0005X
Housing Material	Moulded plastic, 2-part, material Glass Reinforced Polyamide, UV resistant.	Moulded plastic, 3- Part, UV Stabilized Polypropylene
Weight	Weight 350g/12oz (excluding cable & gland/external connectors)	140g/5oz (excluding cable & gland/external connectors)
Conformance	ATEX/Hazloc/IECEx, PTCRB (AT&T) & Verizon approvals, RED, FCC, CE, RoHS, REACH	ATEX/Hazloc/IECEx, CE, RoHS
Ultrasonic Resolution	±1cm / ±0.4”	N/A
Communication	LTE CAT-M1 or NB-IoT or 2G	N/A
Operating Temperature	-4°F to 122°F (-20°C to 50°C)	-4°F to 122°F (-20°C to 50°C)
Storage Temperature	32°F to 86°F (0°C to 30°C)	32°F to 86°F (0°C to 30°C)

Manufacturing Worldwide

Rochester Sensors
Engineering Innovative Solutions™

Characteristics		Liquid Level logger LTE CAT-M1/NB-IoT/2G - Ultrasonic sensor Exi
Accuracy		Typically ±2cm from 12cm to 3m / ±0.78" from 4.7" to 118"
Ultrasonic Resolution		±1cm / ±0.4"
Signal Divergence		See polar plot **(Note3)**
Battery life		Up to 10 years **(Note 2)**
Manual Activation		Magnetically activated reed switch / Audible buzzer
Altitude Range		<2Km/1.25miles above sea level
Battery technology		3.6V Lithium Thionyl Chloride Exi "Bobbin type" construction
Power requirements		Battery pack with standard cell sizes connected with a 2 wire harness included
BG96	Radio Frequency	LTE FDD (Cat M1 & Cat NB1): B1/B2/B3/B4/B5/B8/B12/B13/B18/B19/B20/B26/B28 LTE TDD (Cat M1): B39 EGPRS: 850/900/1800/1900MHz
	GNSS (GPS)	GPS, GLONASS, BeiDou/Compass, Galileo, QZSS
BG95	Radio Frequency	LTE FDD (Cat M1): B1/B2/B3/B4/B5/B8/B12/B13/B18/B19/B20/B25/B26/B27/B28/B66/B85 LTE FDD (Cat NB2): B1/B2/B3/B4/B5/B8/B12/B13/B18/B19/B20/B25/B28/B66/B71/B85 EGPRS: 850/900/1800/1900MHz
	GNSS (GPS)	GPS, GLONASS, BeiDou, Galileo, QZSS
Humidity		0 – 100% RH
Environmental Protection		IP68 - Outdoors
Software Features		Includes Tekelek's advanced sonics with quality parameters
Tank mounting options		Sensor fits directly into 1 ¼", 1 ½" or 2" BSP existing tank connection
RoHS 2 Directive (2011/65/EU) & Delegated Directive RoHS 3 (EU) 2015/863		This Directive lays down rules on the restriction of the use of hazardous substances in electrical and electronic equipment (EEE) with a view to contributing to the protection of human health and the environment, including the environmentally sound recovery and disposal of waste EEE.
Reach Compliance		ICES-003 Issue 6 Class B Digital Apparatus emissions requirement (Canada) CFR 47 FCC Part 15 Subpart B Class B emissions requirements (USA)
FCC Compliance		ICES-003 Issue 6 Class B Digital Apparatus emissions requirement (Canada) CFR 47 FCC Part 15 Subpart B Class B emissions requirements (USA)

Operation

The Intrinsically Safe Exi ultrasonic sensor is suitable for Monitoring Liquid levels up to 4m / 13 ft depth. It has a 3m / 10 ft cable with an IP68 connector to facilitate mounting. The Ultrasonic Exi sensor communicates to the logger via UART serial bidirectional communications TTL 3.3V level 1200 baud, no parity, 8 data bits.

Configuration/Specification Options

External connection	IP68 Cable gland / IP68 bulkhead connector
Antenna	Internal with option for antenna coupler with SMA connector to allow connection of an external GSM antenna
Data Communications	Makes a TCP connection to the server over 2G, NB-IoT or CAT-M1 cellular network and delivers its payload using a proprietary Tekelek binary
Fixing/Mounting	Screw mounts (4), tie wrap, & pole mount features are standard.

Note 1: Note: range de-rates to 30cm / 8" < 0°C
Note 2: Based on 1 communication per day and good network coverage
Note 3: The maximum spatial diversion of the ultrasonic signal is shown on a polar plot included with this datasheet.
Note 4: Suitable for use in tanks for the storage of water diesel fuel, kerosene, oil types A2,C1,C2 and D as defined by BS2869.

Signal Divergence Plot