Overview

The Radar Level Recorder (aka RLR) allows users to precisely measure stage (water level) without direct contact with the water’s surface. With its integrated antenna, this unit is ideal for monitoring rivers, streams, reservoirs, tidal areas & industrial areas. Using a pulse-echo measurement technique, the radar has an accuracy of 0.01 feet & a range of 60 ft.

Sutron’s Radar Level Recorder model RLR-0003-1 is FCC (Federal Communications Commission) Certified and NTIA (National Telecommunications & Information Administration) approved for appropriate applications.

The FCC-approved RLR model is available for any commercial or government agency in need of the device. This version has an FCC ID and is available for installation anywhere as an FCC part 15 device.

The NTIA versions are available only to US government agencies and for use outside the US. US government agencies who need to use the NTIA version must have it approved for operation by their own frequency coordinators. Both radars offer similar performance; however, the NTIA version does have increased signal to noise for quicker measurements and better performance with rough water.

The RLR-0003 is an integrated, hardened unit without display. The enclosure is rugged and can be installed outdoors without additional protection. All the electronics for the radar are housed in the antenna enclosure. A 25 foot long cable provides both RS232 and SDI-12 interfaces to the radar.

Features

- Special pulse-echo technique with 0.001 ft resolution & 0.01 ft accuracy
- Not affected by air temperature & humidity
- Internal memory of 32 MB (>300,000 readings)
- SDI-12 & RS232 interfaces
- Powerful data processing modes including averaging & NOAA DQAP
- Diagnostic tools include recording of signal strength & standard deviation.
- Integrated antenna
- Operates as stand-alone station or integrates with other DCPs
- Connects to a SatLink2 Transmitter/Logger & IridiumLink for satellite communications & GPRSLink & CDMALink for cell modem communications.

Applications

- Tides, Oceans, Coastal
- Surface Water
- Lock Monitoring
- Flood Monitoring, Warning
- Canals
- Bridge Mounted Monitoring
- Rapid Deployment Gauge Replacement
- Bubbler System Alternative
- Shaft Encoder with Stilling Well Alternative
# SPECIFICATIONS

Specifications subject to change without notice

<table>
<thead>
<tr>
<th>Measurements</th>
<th>Stage/Level measurements, Battery.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Automeasure Interval</td>
<td>1 second to 24 hours</td>
</tr>
<tr>
<td>Measurement Technique</td>
<td>Pulse-echo technique operating about 6GHz with beamwidth of +/- 16 degrees</td>
</tr>
<tr>
<td>Log/Averaging Intervals</td>
<td>User selectable</td>
</tr>
<tr>
<td>Radar Type (NTIA)</td>
<td>6.2 GHz pulse echo</td>
</tr>
<tr>
<td>Radar Type (FCC)</td>
<td>6.6 GHz pulse echo</td>
</tr>
<tr>
<td></td>
<td>FCC ID HDBRLR-0003-1</td>
</tr>
<tr>
<td></td>
<td>FCC Standard: Part 15.250</td>
</tr>
<tr>
<td>Beamwidth</td>
<td>±16° HPBW</td>
</tr>
<tr>
<td>Stage/Level Accuracy</td>
<td>0.05% reading, 0.01 ft (3mm) minimum</td>
</tr>
<tr>
<td></td>
<td>0.05% above 20 ft</td>
</tr>
<tr>
<td>Stage/Level Range</td>
<td>60 feet (18.3 meters)</td>
</tr>
<tr>
<td>Calculations</td>
<td>Discharge can be calculated using Parshall Flume &amp; Broad Crested Weir equations or general purpose equation with user entered constants. Calculation of daily volume and daily average stage.</td>
</tr>
<tr>
<td>Enclosure</td>
<td>NEMA 4X, IP66, IP67</td>
</tr>
<tr>
<td></td>
<td>Resists dripping water and spray</td>
</tr>
<tr>
<td></td>
<td>RLR-0001-1 is not suitable for outdoor installation without appropriate enclosure.</td>
</tr>
<tr>
<td>Communication Ports</td>
<td>SDI-12, RS232</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>-40°C to +60°C</td>
</tr>
<tr>
<td>Sampling Rate</td>
<td>10 Hz</td>
</tr>
<tr>
<td>Memory</td>
<td></td>
</tr>
<tr>
<td>Built-In Flash</td>
<td>&gt;300,000 readings</td>
</tr>
<tr>
<td>SD/MMC Card</td>
<td>no</td>
</tr>
<tr>
<td>USB</td>
<td>no</td>
</tr>
<tr>
<td>Ethernet</td>
<td>no</td>
</tr>
<tr>
<td>Clock Accuracy</td>
<td>2 minutes per month (at 0°C – 40°C)</td>
</tr>
<tr>
<td>Power Requirements</td>
<td>5.5 to 16 VDC</td>
</tr>
<tr>
<td>Current Drain</td>
<td>&lt;1mA @12 VDC standby</td>
</tr>
<tr>
<td></td>
<td>&lt;0.90 mA @ 12 VDC standby, RS232 disconnected</td>
</tr>
<tr>
<td></td>
<td>&lt;12 mA @ 12 VDC standby, RS232 connected</td>
</tr>
<tr>
<td></td>
<td>&lt;36-40 mA @ 12 VDC active measurement</td>
</tr>
<tr>
<td>Communication Protocols</td>
<td>MODBUS, SDI-12</td>
</tr>
<tr>
<td>Programming</td>
<td>via RS232, SDI-12</td>
</tr>
<tr>
<td>Device Dimensions</td>
<td></td>
</tr>
<tr>
<td>Height</td>
<td>12.5 in. (31.8 cm)</td>
</tr>
<tr>
<td>Diameter</td>
<td>7 in. (17.8 cm)</td>
</tr>
<tr>
<td>Weight</td>
<td>7 lbs. (3.2 Kg)</td>
</tr>
</tbody>
</table>

### ORDERING

<table>
<thead>
<tr>
<th>Part #</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RLR-0003-1 REVF</td>
<td>RLR, FCC, no display, 25 foot removable cable</td>
</tr>
<tr>
<td>RLR-0003-1 REVN</td>
<td>RLR, NTIA, no display, 25 foot removable cable</td>
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</table>

### SHIPPING

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shipping Height</td>
<td>14 in. (35.6 cm)</td>
</tr>
<tr>
<td>Shipping Length</td>
<td>14 in. (35.6 cm)</td>
</tr>
<tr>
<td>Shipping Width</td>
<td>9 in. (22.9 cm)</td>
</tr>
<tr>
<td>Shipping Weight</td>
<td>12 lbs. (5.5 Kg)</td>
</tr>
</tbody>
</table>

### RLR BEAMWIDTH

- 0.05% accuracy (±0.01 ft. at less than 20 ft.)
- 6.2 GHz pulse echo (NTIA)
- 6.6 GHz pulse echo (FCC -15.250)
- 16° Half-Power Beam Width (HPBW)

<table>
<thead>
<tr>
<th>Distance to Water</th>
<th>Beamwidth (Radius in Feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>3</td>
</tr>
<tr>
<td>20</td>
<td>6</td>
</tr>
<tr>
<td>30</td>
<td>9</td>
</tr>
<tr>
<td>40</td>
<td>12</td>
</tr>
<tr>
<td>50</td>
<td>15</td>
</tr>
<tr>
<td>60</td>
<td>18</td>
</tr>
</tbody>
</table>