



LD2000

ARCHITECT AND
ENGINEER SPECIFICATIONS

RLE TECHNOLOGIES
REV. 1.0 110059

1. GENERAL SPECIFICATION

- 1.1 The contractor shall provide RLE Technologies' SeaHawk LD2000 Distance Read Water Leak Detection System to perform the functions of water leak detection, event annunciation, and integration into other alarm management systems. The system shall include, but not be limited to: a SeaHawk LD2000 Distance Read Controller, SeaHawk Water Leak Detection Cable—patent # 6144209 (no substitutions permitted), an LC-KIT (leader cable and end-of line terminator), a framed reference map, and optional installation accessories.
- 1.2 The SeaHawk LD2000 System components listed above shall be manufactured by RLE Technologies, 104 Racquette Drive, Fort Collins, CO 80524, U.S.A., Tel (970) 484-6510, Fax (970) 484-6650, URL: www.rletech.com

2. CODES/STANDARDS COMPLIANCE

- 2.1 The SeaHawk LD2000 System shall have the following listings and approvals:
 - 2.1.1 CE; EMC – EN61326 1997 Class A
 - 2.1.2 ETL Listed; UL STD 61010A-1; EN STD 61010-1; CAN/CSA C22.2 STD NO. 61010-1
 - 2.1.3 CL2P/CMP per UL STD (for SeaHawk Water Leak Detection Cable); ANSI/NFPA 262

3. COMPONENT DESCRIPTION

3.1 SEAHAWK LD2000 DISTANCE READ CONTROLLER

- 3.1.1 The LD2000 shall be capable of monitoring up to 2,000 feet (609.6m) of RLE Technologies SeaHawk Water Leak Detection Cable and shall have a leak response time of less than 30 seconds, a typical sensing repeatability of ± 2 feet (.61m) $\pm 0.25\%$ of total cable length, and a detection accuracy of ± 2 feet (0.61m) $\pm 0.5\%$ of the cable length.
- 3.1.2 The LD2000 shall have the following indicators, switches and/or buttons:
 - A.) One green/red/yellow tri-color power/status LED that illuminates green when the power is on, red when a leak is detected, and yellow when a cable fault or cable contamination is detected.
 - B.) One four-digit, seven-segment red LED display that indicates the distance in feet or meters to the leak location on the Seahawk Water Leak Detection Cable.
 - C.) One Test/Reset push button which shall be used to reset the unit, clear any alarms, and check for any new alarm conditions.
 - D.) One two-position DIP switch for:
 - i.) Selecting between 100BASE-T and autodetect 10/100BASE-T Ethernet connection.
 - ii.) Enabling and disabling EIA-485 resistor termination.
- 3.1.3 The LD2000 shall be constructed as a stand alone unit suitable for vertical surface wall mounting and shall be housed in a metal Type 1 enclosure. The overall size of the LD2000 shall be 8.0"W x 4.25"H x 1.25"D (203mmW x 108mmH x 32mmD), and shall weigh less than or equal to 1.5 lb (680g).
- 3.1.4 The LD2000 shall operate on 24VAC 50/60 Hz, single-phase isolated or 24VDC @600mA max power supply. An optional wall mount enclosure (LD-ENC) will be available to allow the LD2000 to accommodate a 100/120/230-240VAC 50/60 Hz universal voltage input.
- 3.1.5 The LD2000 shall be suitable for operating at ambient temperatures between 32°F and 122°F (0°C and 50°C), relative humidity between 5% and 95%, non-condensing and a maximum altitude of 15,000 feet (4572m). The LD2000 shall be suitable for storage at temperatures between -4°F and 158°F (-20°C and 85°C).

- 3.1.6 The LD2000 shall include one Form C Summary Alarm Relay with contacts rated at 1A at 24VDC, 0.5A resistive at 120VAC. The relay shall be configurable as latched or non-latched and supervised or non-supervised.
- 3.1.7 The LD2000 shall be configured either via a web-based (HTML) configuration and setup menu accessible from an Ethernet connection, or via a terminal-based menu accessible via EIA-232. All configuration menus shall be password protected.
- 3.1.8 The LD2000 shall be capable of Modbus and BACnet communications via the EIA-485 serial port. Baud rates shall be user selectable.
- 3.1.9 The LD2000 shall be capable of Ethernet communications over a 10/100BASE-T network via the RJ45 Network port. Communications protocols supported over the Ethernet connection shall include SNMP, SMTP (email), Modbus TCP/IP, BACnet IP, and web-based (HTML) access.
- 3.1.10 The LD2000 shall be capable of sending alarms via SNMP traps, SMTP (email; up to four designated recipients), Modbus, and BACnet.
- 3.1.11 The LD2000 shall continuously supervise the electrical and mechanical integrity of the SeaHawk Water Leak Detection Cable.
- 3.1.12 The LD2000 shall allow leak detection sensitivity and cable contamination setting adjustments. It shall be possible to manually and automatically calibrate the LD2000 without the manufacturer's intervention. An optional password shall safeguard any unauthorized system calibration.
- 3.1.13 The LD2000 shall monitor up to eight user configurable virtual zones defined by the cable length at the beginning of the virtual zone. A unique description of each virtual zone will be user configurable. An additional eight zones can be used to display the actual distance to leaks detected by other leak detection systems (LD5100, LD2000, & LD1500) that are integrated via Modbus RTU (EIA-485) or Modbus TCP/IP (RJ-45) into the LD2000 system.
- 3.1.14 The LD2000 shall maintain a trend log containing the cable current level recorded at configurable intervals (1 minute to 1440 minutes (1 day)), for the last 288 intervals. An event log shall also provide a record of the last 100 events. Logged events shall include, but not be limited to, Alarms, Cable Faults, and System Restarts.
- 3.1.15 The LD2000 shall maintain the trend log and event log in nonvolatile memory, so that the logs shall survive events such as power failures and hard resets. The LD2000 Controller shall keep the logs in first-in-first-out (FIFO) order.
- 3.1.16 The LD2000 shall utilize Network Time Protocol (NTP) to synchronize its internal clock to an external time source.

3.2 SEAHAWK WATER LEAK DETECTION CABLE

- 3.2.1 The SeaHawk Water Leak Detection Cable shall detect the presence of water and other conductive liquids and shall be constructed of two sensing wires and two insulated wires with an abrasion resistant, non-conductive polymer core. Each individual sensing wire shall be covered with a non-conductive polymer mesh to help prevent false alarms from contaminants. The SeaHawk Water Leak Detection Cable shall be fast drying and highly flexible allowing for small bend radii. The SeaHawk Leak Detection Cable shall be available in 10 feet (3.05m), 25 feet (7.62m), 50 feet (15.24m), 100 feet (30.48m), and custom lengths with mating connectors (male/female) pre-installed.
- 3.2.2 The SeaHawk Water Leak Detection Cable shall be suitable for operating at ambient temperatures between 32°F and 167°F (0°C and 75°C), relative humidity between 5% and 95%, non-condensing and a maximum altitude of 15,000 feet (4572m). The Water Leak Detection Cable shall be suitable for storage at temperatures between -22°F and 185°F (-30°C and 85°C) and shall be plenum rated to CL2P per UL (ANSI/NFPA262). The SeaHawk Water Leak Detection Cable shall have a Sheer Strength of > 180 lbs. (81.65kg) and a Cut Through Resistance of > 40 lbs (18.14kg) with a .005in (0.127mm) blade.

3.3 INSTALLATION ACCESSORIES

- 3.3.1 The LC-KIT includes a 15 feet (4.57m) leader cable and an end-of-line terminator (used on the last length of cable or Spot Detector connected to the system) is required for the LD2000.
- 3.3.2 SeaHawk Non-Sensing Cable (NSC) shall be used to bridge between sections of SeaHawk Water Leak Detection Cable where water leak detection is not needed. The SeaHawk NSC shall be plenum rated to CL3P per UL. NSC shall be available in 10 feet (3.05m), 25 feet (7.62m), 50 feet (15.24m), 100 feet (30.48m), and custom lengths with mating connectors (male/female) pre-installed.
- 3.3.3 The SD-Z spot detector can be integrated into the system for use in areas where only a spot detector may be needed. The overall size of the SD-Z shall be 1.55"W x 2.0"H x 1.0"D (39.37mmW x 50.8mmH x 25.4mmD). Preinstalled male and female connectors on the SD-Z allow for integration between lengths of SC and/or NSC cable. The SD-Z Detector shall appear as a 50 foot (15.24m) length of SC cable. A leak detected by the SD-Z Detector shall appear as a leak located at the midpoint, or at a point 25 feet (7.62m) along the simulated 50 foot (15.24m) section of SeaHawk Water Leak Detection Cable.
- 3.3.4 An X-Connector (X-CON) shall be used to branch the SeaHawk Leak Detection Cable in multiple directions. The X-CON shall be constructed with a single cable input, a single cable output and two additional branch lines. Multiple X-CONs can be used within a single system and the accuracy of the system shall not be affected. The cable output and both branch lines will add the equivalent of 50 feet (15.24m) to the system to add distinct separation of the outputs. The overall size of the X-CON shall be 2.0"W x 0.9"H x 3.0"D (50.8mm x 22.86mm x 76.2mm).
- 3.3.5 J-Clips (JC) shall be used to secure cables every 4 feet (1.22m) and on any corners or bends of the SeaHawk Water Leak Detection Cable and/or SeaHawk Non-Sensing Cable. The overall size of the J-clips shall be 1"W x 1.1"H x 0.5"D (25mmW x 28mmH x 12mmD). J-clips shall be available in quantities of 10, 25, 50, and 200.
- 3.3.6 A Weighted Cable Connector (WCCS-50) shall be used to simulate 50 feet (15.24m) of SeaHawk Water Leak Detection Cable and provide distinct separation between areas of coverage. The overall size of the WCCS-50 shall be 2.5" x 1.0" (63.5mm x 25.4mm).
- 3.3.7 An optional wall mount enclosure (LD-ENC) will be available to allow the LD2000 to accommodate universal voltage input and shall operate on 100/120/230-240VAC @500mA max, 50/60 Hz, single-phase power supply (field selectable). The overall size for the LD-ENC shall be 12.5"W x 10"H x 3.25"D (318mmW x 254mmH x 82.5mmD) and the LD-ENC shall weigh 10 lbs. (4.53 kg).
- 3.3.8 A Leak Detection Reference Map (FM1114) shall be available for purchase from RLE Technologies to identify the actual location of any water leaks detected by the SeaHawk LD2000 Water Leak Detection System. This map shall be prepared from "as built" drawings created after complete system installation. The Leak Detection Reference Map shall identify room layout, cable routing and distance markers in feet or meters. The overall size of the FM1114 shall be 11" x 14" (27.9cm x 35.5cm)

4. SYSTEM COMMISSIONING AND MAINTENANCE

- 4.1 **The RLE Technologies Leak Detection System shall be installed and maintained as recommended in the RLE Technologies' SeaHawk LD2000 User Guide**



FORT COLLINS CO
970 484-6510
970 484-6650 FAX
www.rletech.com