



# Automatic Tank Gauging and Leak Detection System Bid Specification

## *Colibri Tank Monitor*

Franklin Fueling Systems  
October 2012  
000-1738 REV A  
An ISO 9001 Registered Company



## **Part 1 – General System Requirements**

### *1.1 Description*

- A. These specifications are intended to provide information for prospective bidders in order to understand the requirements for providing and installing a monitoring system for aboveground and underground liquid storage tanks.
- B. These specifications shall describe precisely a continuous aboveground/underground storage tank leak detection system that performs in accordance with USEPA 40 CFR 280 Subpart D and shall meet the performance specifications and functions of the Franklin Fueling Systems Colibri Tank Monitor.
- C. The aboveground/underground storage tank monitoring system shall meet all applicable standards and regulatory agency requirements, including, but not limited to, the standards and requirements of the following:
  - 1. American National Standards Institute (ANSI)
  - 2. American Petroleum Institute (API)
  - 3. American Society for Testing and Materials (ASTM)
  - 4. Environmental Protection Agency (EPA)
  - 5. National Bureau of Standards (NBS)
  - 6. National Electric Code (NEC)
  - 7. National Fire Protection Agency (NFPA)
  - 8. Underwriters Laboratories, Inc. (UL)
  - 9. Canadian Underwriters Laboratories, Inc. (cUL)
  - 10. Underground Storage Tanks: Subpart D, 40 CFR Part 280
  - 11. Federal Communications Commission (FCC)
  - 12. Explosive Atmospheres (ATEX)

### *1.2 Governing Standards*

- A. Governing Standards for Tank Monitoring Systems including probes and accessories shall be:
  - 1. EPA Regulations 40 CFR Sub Part D

2. Certification by an Independent Laboratory using EPA Protocol (#EPA/530/UST-90/006) for annual and monthly tank testing.
3. Certification by an Independent Laboratory using Evaluation Protocol for Continuous In-Tank Leak Detection Systems (CITLDS) (Jairus D. Flora 1/7/2000).
4. Certification by an Independent Laboratory using EPA Protocol (#EPA/530/UST-90/010) for pipeline leak detection systems. Certification should include approvals for hard pipe and flexible piping systems.
5. National Work Group (NWGLDE)
6. Underwriters Laboratory (UL)

## **Part 2 – Operational Specifications**

### *2.1 In-Tank Leak Detection*

- A. The system shall utilize in-tank probes based on magnetostrictive technology for liquid level measurement and in-tank leak detection.
- B. The Automatic Tank Gauge (ATG) shall be capable of performing a static tank tightness test to a threshold of 0.1 GPH with at least a 99.9% probability of detection [P (D)] and no more than a 0.1% probability of a false alarm [P (FA)].
- C. The system shall have the ability to conduct statistical continuous automatic leak detection tests and shall not require the shut down of the tanks for scheduled test times.
- D. The system shall have the ability to conduct statistical continuous automatic leak detection for systems that utilize manifold tanks.
  1. The statistical continuous automatic leak detection system shall be capable of performing a test with a 99% probability of detection.
  2. The statistical continuous automatic leak detection system shall be capable of handling up to a two-tank manifold.
  3. The system shall utilize dynamic feedback variables in the algorithm to evaluate the noise factor patterns associated with a tank, and thereby adapt the algorithms to each individual tank.

4. The system shall perform a new 0.2 GPH tank tightness evaluation as soon as it has accumulated a statistically significant amount of idle period information in the database.
5. The system, when operated in the statistical continuous leak detection mode, shall be third party certified for statistical leak detection in tanks up to 49,000 gallons and throughput of 257,000 gallons per month. The test shall meet or exceed U.S. EPA standards with a 98% probability of detecting a 0.2GPH leak and less than a 2% probability of false alarm. The system also shall meet any federal, state and local compliance requirements for in-tank leak detection.

## 2.2 *Product Inventory Management (Tank Gauging)*

- A. The tank monitoring system shall cull float height and temperature data from magnetostrictive level probes and utilize the data to calculate and display the following:
  1. Product Level
  2. Water Level
  3. Gross Product Volume
  4. Temperature compensated (Net) Product Volume
  5. Gross Water Volume
  6. Product Temperature
- B. The system shall be capable of monitoring and recording inventory management information for a Manifold (multiple tanks that are connected by a siphon)
- C. The system shall treat the manifold as a separate entity from the individual tanks and display the following information for each manifold about the combined volumes of all the tanks in the manifold.
  1. Gross Product Volume
  2. Temperature compensated (Net) Product Volume
  3. Gross Water Volume
- D. The system shall automatically detect and record a product delivery when product added to a tank or manifold exceeds a programmable delivery threshold volume. The data recorded shall include relevant information including the time and date of the

delivery and the starting and ending values of the tank or manifold parameters listed above.

- E. The system shall be capable of storing a history of recorded deliveries.
- F. The system shall have the ability to monitor both aboveground storage tanks (AST), and underground storage tanks (UST), for inventory management.

#### *2.2.1 Inventory Reconciliation*

- A. The system shall be capable of performing inventory reconciliation by comparing dispenser sales transactions with inventory management and delivery information to calculate a variance for each reconciliation period.
- B. The system shall be capable of performing reconciliation periods as frequent as hourly.
- C. The system shall have the ability to receive dispenser sales transactions from the dispenser control system using multiple methods.
- D. The system shall automatically calculate the total Sales, Deliveries and Variance for each month and determine an Over or Short condition based on programmable parameters.
- E. The system shall allow the manual adjustment of sales and delivery information to account for activities that may cause false variances.

#### *2.2.2 Optimized Tank Calibration*

- A. The system shall have the capability to alter automatically the tank-strapping charts to utilize a re-calibrated, accurate tank chart after system setup.
- B. The system shall have the ability to re-calibrate automatically the complete tank with a limited range of data gathered at the operating level of the tank during the calibration period.
- C. The system shall provide a customized calibration chart for each tank to minimize intrinsic tank-level error sources.
- D. The system shall re-calibrate the tank geometry automatically under the normal operating conditions.

- E. The system shall use inventory measurements gathered by the gauge with dispensed sales information collected automatically by the system from the pulse totalizer during the calibration process.

### 2.3 *Density Measurement*

- A. The system shall be capable of measuring the density of gasoline and fuel oil products.
- B. The system shall have programmable alarm set points for density measurement.
- C. The system shall be able to calculate and display Product Mass.
- D. The density of each product shall be displayed on the LCD touchscreen, web pages and included on inventory reports.

### 2.4 *Reports*

- A. The system shall be capable of generating a variety of reports including but not limited to:
  - 1. Inventory
  - 2. Delivery
  - 3. Tank Leak test (Static and Continuous)
  - 4. Alarm (Active and History)
  - 5. Application Event History
  - 6. Inventory Reconciliation
  - 7. Regulatory
- B. The system shall have the ability to generate reports via an external printer, email and web interface.
- C. The system shall have the ability to automatically generate reports at a scheduled date and time.
- D. The system shall have the ability to generate reports covering a selectable date range.

### 2.5 *Interfacing*

- A. The system shall come standard with multiple ports for interfacing with local and remote devices.

### *2.5.1 Serial Communications*

- A. The system shall provide an RS-232 port for interface with local devices such as a computer, point of sale terminal, or external modem for remote communications.

### *2.5.2 Modem*

- A. The system shall have the ability to connect to an external modem, including a cellular modem, to answer calls from remote devices and connect and communicate according to programmed parameters.

### *2.5.3 Ethernet Port*

- A. The system shall have an Ethernet port for connecting to Local Area Networks, Computers, or other devices.

### *2.5.4 USB Port*

- A. The system shall include two USB ports for interfacing with common external printers and modems.

### *2.5.5 Web Interface (XML based)*

- A. The system shall have the ability to interface with a web browser using standard XML protocol.
- B. Access via web interface shall be restricted via multiple password controlled access levels.

### *2.5.6 Color LCD Touchscreen*

- A. The system shall have a Color LCD Touchscreen for local interface.
- B. Access via Color LCD Touchscreen shall be restricted via multiple password controlled access levels.

## *2.6 Dispenser Interface*

### *2.6.1 Electronic Dispenser Interface*

- A. The system shall have the ability to retrieve metered volume data from a pump controller or POS terminal via either an Ethernet or Serial connection.

## 2.7 *Input/Output Devices*

### 2.7.1 *Output Relays*

- A. The system shall have the ability to enable external audible/visible alarms or control external devices through a relay contact closure.
- B. The Output Relays should be able to be configured in either a Normally Open or a Normally Closed orientation.
- C. The system shall have the ability to control the state of the Output Relays on user defined Alarms, Events, Inputs or Scheduled Date/Times.

## 2.8 *Alarms and Events*

- A. The tank monitoring system shall have the ability to produce an audible and visual indication of all system, in-tank and leak alarm and warning conditions.
- B. The system shall have the ability to record and report system events.
- C. The in-tank alarms shall include but not be limited too:
  - 1. Product Level Limit -Overfill (HIGH and HIGH/HIGH)
  - 2. Product Theft
  - 3. Delivery Needed - Low Product (LOW and LOW/LOW)
  - 4. Leak Detected
  - 5. High Water Level
- D. The tank monitoring system shall provide an audible and visual alarm for in-tank leak test failures (0.1 GPH and 0.2 GPH).
- E. The system shall also have the ability to print all alarm conditions on an external printer.
- F. The system shall be capable of communicating immediately all alarm conditions via external modem or Ethernet port to a central computer.
- G. The system shall offer the capability to disable the audible portion of an alarm immediately, but allow the visual alarm to remain visible until the alarm condition has been remedied.



- H. The system shall be capable of providing an external audible and visual alarm with an acknowledgement switch, which shall have the ability to interface to the tank monitoring system via an Output Relay. The external alarm box and acknowledgement switch shall have appropriate casing for outdoor installation.
- I. The system shall maintain a history of alarms and events that have occurred.

## 2.9 *System Setup*

- A. The system shall include parameter-driven software that will modify the tank monitor to the appropriate site specifications. The parameters must be able to be entered in assigned fields at the time of system startup. In addition, the parameters must be able to be updated locally and remotely during and after startup to allow for changes in site parameters.
- B. The system shall offer a password protected access level to modify setup parameters to prohibit unauthorized changes.
- C. The system shall allow the setup data to be downloaded via web interface in single file format.
- D. The system shall have the ability to upload via web interface a setup data file and reconfigure itself to those parameters.
- E. Set-up parameters shall include but not be limited to the following:
  - 1. Site Identification Data
  - 2. System Configuration Data
  - 3. Tank Setup Data
  - 4. Probe Setup Data
  - 5. Product Setup Data
  - 6. Manifold Setup Data
  - 7. In-tank Leak Test Setup Data
  - 8. Continuous Automatic Tank Leak Detection Setup Data
  - 9. Date/Clock Setup Data
  - 10. Annunciator (audible alarm) Setup Data
  - 11. Output Relay Setup Data
  - 12. Communication Port Setup Data

- 13. Dispenser Interface Setup Data
  - 14. Reconciliation Setup Data
  - 15. Tank Autocalibration Setup Data
  - 16. Density Measurement Setup Data
  - 17. Email Server Setup Data
- F. The system setup parameters shall include the ability to create custom rules that control what actions the system will take in response to certain events. Events would include but not be limited to alarms, deliveries, leak tests and scheduled events. Actions would include but not be limited to sounding an alarm, controlling an output relay or sending an email or fax.

#### 2.10 *Remote Monitoring Software*

- A. The system manufacturer shall offer a communications/database software package that allows the user to automatically collect data from multiple remote tank monitoring sites from a central location.
- B. The software shall provide the ability to communicate with the tank monitoring system via an RS-232 serial interface, modem, Wide Area Network or Internet.
- C. The software shall have the ability to poll designated locations automatically and continuously, and store the gathered data in a standard database format. The system shall be able to perform the data retrieval on a user-defined schedule, or on demand.
- D. The information in the database shall be easily exported into other standard software packages for data organization.
- E. The software shall be able to generate reports that may be used for inventory, environmental compliance, or business management purposes. These reports shall be able to be run on demand, and report on either the whole database, or only selected ranges of the database.
- F. The software system shall provide the ability to retrieve all diagnostic data from the tank monitoring system and have the ability to backup and recover the data that have been stored.
- G. The software package shall have the ability to communicate with any ATG utilizing the INCON Native language, INCON XML language, Veeder-Root 250 or 350

languages. The software shall have the ability to support multiple types of tank gauges within the same network.

### **Part 3 – Product Specifications/Capacities**

#### *3.1 Console*

- A. The console shall have internal mounting holes for wall mounting.
- B. The console shall be equipped with a color touch screen, backlit, liquid crystal display (LCD) with a diagonal viewing area of 5.6 inches, to be used for on-site viewing of all inventory, leak detection, and alarm information.
- C. The touch screen LCD display shall have icon based alphanumeric functions for programming, operating and reporting.
- D. The console shall provide a web based user interface via Ethernet or RS-232 ports
- E. The console shall have three front-panel indicators to provide a visual indication of “power on”, “warning”, and “alarm” conditions.
- F. The console shall be equipped with a back-up battery to maintain all programming information as well as inventory, leak detect and alarm information in the event of a power failure.
- G. The console shall be equipped with conduit openings and plugs on the top and bottom of the monitor for rigid conduit entry into the monitor.
- H. The console shall have the ability to communicate directly with an external POS terminal or PC. The system shall also be capable of communicating with a remote device via Ethernet connection or external modem.
- I. The console shall be capable of selectively communicating in multiple languages and use an icon/symbol based interface for ease of use in all languages.
- J. The console shall be equipped with internal audible and visual warning and alarm indicators.
- K. The console shall be intrinsically safe, with Underwriter Laboratories (UL), Canadian Underwriter Laboratories (cUL), ATEX (Europe) and International Electrotechnical Commission (Explosive Atmospheres) (IECEX) approval.
- L. The console shall comply with FCC testing, FCC Part 68 and Part 15.

- M. The console must be mounted and wired according to the installation manuals supplied by the manufacturer, with all intrinsically safe field wiring enclosed in dedicated conduit and separate from all other wiring.
- N. The console shall continuously monitor all probes and report normal operating conditions as well as system malfunctions or failures.

### 3.2 *Tank Gauging and In-Tank Leak Detection*

- A. The system shall be capable of monitoring up to 6 probes
- B. The system shall be Third-Party Certified to perform both Static and Continuous in-tank leak detection.
- C. The system shall have the ability to monitor the density of the contents of the tanks.

### 3.3 *Probes*

- A. The probe shall have the ability to use specified Belden twisted shielded pair cable with conductors between 18 AWG and 22 AWG for field connections.
- B. There shall be no more than two conductors between each probe and control console.
- C. The probe shall be capable of performing a leak detection test of 0.1 GPH and 0.2 GPH.
- D. The probe shall have the required Third-Party Certification in accordance with the U.S. EPA's "Standard Test Procedure for Evaluating Leak Detection Methods: Automatic Tank Gauging Systems" (0.2 GPH monthly monitoring).
- E. The probe shall have the required Third party Certification in accordance with the U.S. EPA's "Volumetric Tank Tightness Testing Method" (0.1 GPH annual tank tightness test).
- F. The probe shall be compatible for both AST and UST installations.
- G. The manufacturer shall offer an install kit for easy installation and removal of the probe.
- H. The probe shall be capable of being installed in 2" or 4" tank openings.
- I. The probe shall be manufactured with a minimum of 5 RTD Temperature Sensors and have a 316 stainless steel shaft.

- J. The probe shall be available in an Inventory Only model that contains a single RTD Temperature Sensor and does not support leak detection.

### 3.4 *Density Measurement*

- A. The system shall have the ability to measure and report the density and mass of gasoline and fuel oil products.
- B. The system shall be able to be configured to alarm if the density of a product exceeds a programmed range.
- C. The density measurement capability shall be achieved using the same magnetostrictive probe that provides in-tank inventory and leak detection.

### 3.5 *Serial Communications Interface*

- A. The system shall have the capability to communicate directly with a computer or a point of sale console.
- B. The system shall have the ability to support a network connection to a PC via an RS-232 serial communication port for web browser interface.
- C. The RS-232 port shall be able to support Point to Point or Veeder-Root 250/350 protocols.

### 3.6 *Ethernet*

- A. The system shall contain an Ethernet port with a snap in RJ-45 jack for direct data transmission over an Ethernet based Wide Area Network or Internet.
- B. The system shall have indicator LEDs to show Ethernet port operability and connectivity.
- C. The Ethernet port shall be able to support Veeder-Root 250/350 protocols

### 3.7 *Tank Reconciliation and Autocalibration*

- A. The system shall be capable of obtaining fuel sales transactions via the following methods.
  - a. RS-232 Interface to a POS or site controller

- b. Ethernet connection to Local Area Network
- B. The system shall automatically compile sales transactions, deliveries and in-tank inventory information and reconcile the totals at the end of each shift, day or period into a comprehensive reconciliation report.
- C. The system shall be capable of conducting an automatic tank calibration process through typical operating levels in the tank as fuel is dispensed.

#### **Part 4 – Manufacturer’s Support/Field Service**

##### *4.1 Technical Support*

- A. The manufacturer shall offer technical phone support to customers for at least 12 hours a day.
- B. The manufacturer shall provide technical phone support available to authorized distributors and certified contractors for on-site trouble shooting of the tank monitoring system.

##### *4.2 Field Service*

- A. The manufacturer shall maintain a trained technical service network available for providing on-site customer support and training, as well as overseeing and/or performing the start up and programming of tank monitoring systems.
- B. The manufacturer shall have a technical service staff to support the distributor/contractor field service network.

##### *4.3 Certification Training*

- A. The manufacturer shall require and provide mandatory certification training for all of its authorized distributors and service contractors/installers
- B. The certification program shall cover installation, setup/operation, and service/troubleshooting of the manufacturer’s tank monitoring systems.
- C. The manufacturer shall provide certification information on contractor/installer to regulatory agencies that require certification documentation.

- D. The manufacturer shall offer re-certification training to keep contractors/installers current with updated information.

#### 4.4 *Warranty Registration and Checkout Form*

- A. The manufacturer shall require that a certified technician perform all tank monitoring system startups.
- B. The startup shall consist of installation checkout, operation checkout and customer training on use of the equipment.
- C. The manufacturer shall supply a Warranty Registration and Checkout Form to properly document the site information to include:
  - 1. Installation Location
  - 2. Installer
  - 3. Equipment Identification
  - 4. Tank Information
  - 5. Leak Detector Information
  - 6. Startup Distributor Information
  - 7. Customer Approval
  - 8. Installation Check List
  - 9. Training Information
- D. Upon receipt of the Warranty Registration and Checkout Form, the manufacturer will initiate the system warranty and input the data into a site database.

#### 4.5 *Replacement and Service Parts*

- A. The manufacturer shall offer Authorized Distributors pre-selected parts kits to service tank monitoring systems.
- B. The manufacturer shall offer a pre-selected parts kit designed for the service truck and shop.
- C. The manufacturer shall offer a quick-ship service for parts that shall ensure that a part's shipment is sent within 24 hours of request/order.

#### 4.6 *Delivery*

- A. The manufacturer shall have the ability to ship tank monitoring systems to customers based on when the systems are needed by the customer.

#### 4.7 *ISO-9000*

- A. The manufacturer shall maintain an ISO-9001 rating to ensure quality management of design, manufacturing, training and technical documentation.

### **Part 5 – Documentation**

#### 3.3 *Manuals*

- A. The manufacturer shall supply product documentation that addresses the following categories as additional support:
  1. Site Preparation and Installation Instructions
  2. System Setup Instructions
  3. System Operating Instructions
  4. Probe Installation Instructions
  5. Product Data Sheets
  6. Troubleshooting, Application Guides, and Repair Manuals
  7. Wiring Diagrams which include the following:
    - a. Identification of all devices and equipment terminals, and all external connection terminal blocks.
    - b. All external wiring connections with approved wire colors and circuit designations.

#### 3.4 *Third-Party Certification*

- A. The manufacturer shall supply on request, third-party documentation for all products certifying that performance meets or exceeds EPA requirements.

#### 3.5 *Authorized Service Personnel Listing*

- A. The manufacturer shall supply on request, a formal list of all Authorized Distributors and Service Contractors for sales, installation, training and support.



## **Part 6 – Warranty**

### *3.5 System Warranty*

- A. The tank monitoring system shall be warranted for parts and service for a period of one year from date of installation, or two years from the date of manufacture, whichever comes first.
- B. The warranty shall include parts and labor, provided that an authorized manufacturer's representative who follows the manufacturer's warranty/RMA procedure performs all warranty work on site.