

# FUEL MANAGEMENT SYSTEM

BID SPECIFICATIONS

MAY 2022



FLUID MANAGEMENT TECHNOLOGY LLC

2609 Crooks Road #241

Troy, MI, 48084 [www.fluidmt.com](http://www.fluidmt.com)

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## FUEL MANAGEMENT SYSTEM BID SPECIFICATIONS

## **1.0 General Requirements**

### **1.1 Experience**

System manufacturer must have a minimum of five (5) years experience in the design and manufacture of fuel management equipment.

### **1.2 Safety Rating**

System shall be UL and cUL approved.

### **1.3 Expansion**

The system must be capable of accommodating future expansions in the number of: fuel sites; vehicles; drivers; dispensers; nozzles.

### **1.4 Modular Design**

The system shall be modular in design. The modular design will allow for:

- Hot swapping of major components
- Plug-in upgrades
- Plug-in expansion
- Plug-in replacement of modules for quick and easy troubleshooting
- Minimal number of internal interconnecting cables for increased reliability

## **2.0 Fueling Capabilities**

The system shall allow semi-automated fueling.

### **2.1 Semi-Automated Fueling**

In the semi-automated mode, the control, authorization and accounting operations will be conducted automatically by the fuel management system. Manual input will be required by the operator to verify authorized use of the fuel facility.

The semi-automated fueling shall have the following features:

- A contactless tag or card and/or magnetic swipe card and a keypad shall be available to identify each vehicle.
- A contactless tag or card and/or magnetic swipe card and a keypad shall be available to identify each driver.
- The system shall validate that the fueling request conforms with preset user limits. Limits may include: day of the week; time of day; transaction fill limit; daily fill limit; other limits.
- The system shall select the proper fuel dispenser for the vehicle.

- The system shall automatically suspend fueling if the nozzle is removed from the vehicle fuel inlet or no input from the fueling pump is detected. The system shall append to the same transaction if the nozzle is re-inserted into the same vehicle within a specified period. The transaction shall be terminated if the specified period elapses or if the dispenser is turned off.
- The system shall store the fuel transactions.

### **3.0 System Description**

#### **3.1 System Configuration**

The **site controller** shall be a stand-alone unit including:

- The required central processing unit.
- Required peripherals: display; pump control module (see section 5.2 for supported pump protocols); communication module.
- Optional expansion modules: tank gauging module; receipt printer; additional communication modules.

The site controller shall be web enabled to allow independent real-time control, monitoring and reporting via the web using user ID with password and SSL protected link (<https://>).

The browser interface shall allow control and monitoring, maintenance activities, report generation with advanced filters and templates, monitoring of fuel levels, online pump monitoring and more.

Refueling shall take place regardless of the connectivity to the web server.

Refueling limits and restrictions shall be shared to all fuel site controllers enforcing refueling with limits and restrictions when communication is not available.

The site controller shall use a solid-state drive and RTC (Real Time Clock) with back up, along with surge suppressors for transient and noise immunity.

The system shall include automatic power fail recovery.

The central processing unit (CPU) shall have no edge connectors and no moving parts.

The system shall be modular in construction with a minimum of interconnecting cables and wires.

Modules shall be hot swappable.

External interconnects shall be kept to a minimum.

The following physical, electrical and environmental specifications shall be provided:

- Supply voltage: 100 – 240 VAC
- Power consumption: 2A max.
- Operating temperature: -40 F to +158 F (-40 C to +70 C)

The system shall provide flexibility when searching for data within the system without the need for prior knowledge in SQL or other query languages.

The site controller shall support mechanical and electronic dispensers. All links shall be protected and isolated for maximum reliability.

### **3.2 System Start Up**

Initial startup shall require minimal user intervention. Controller set up will require:

- Pump calibration either by keyed data entry or a calibrated dispensing of a known volume.
- Communication configuration

All other operating parameter shall be capable of being set from the web based interface.

### **3.3 Semi-Automatic Mode**

The operator shall enter vehicle ID and/or driver identification via manual authorizing devices including: key tags; magnetic cards; keypad entry; optional HID cards; fleet cards.

The site controller shall authenticate the data and check it against the existing set of limits and restrictions.

If all conditions are met, the site controller shall authorize immediate refueling.

At the end of the refueling process, the nozzle shall be reinserted into the dispenser cradle and the transaction shall be completed and the data sent from the site controller to the web site.

## **4.0 Site Capabilities**

### **4.1 General**

The site controller shall use distributed process. Distributed processing will:

- Increase reliability.
- Increase up time.
- Increase accessibility.

No more than four (4) hoses shall be controlled by one (1) controller to increase accessibility.

The system shall be based on web server technology and enable easy secured (SSL) remote access through the network using an internet browser, without the need for any application software

The site controller shall communicate via the cloud with a central high-performance web server hosted on Amazon Web Services. Additionally, all the data for all sites can be compiled into a single report.

The number of hoses to be controlled shall be limited only by the number of controllers installed.

Each site controller shall be capable of being available for refueling 24/7.

Restrictions may be set on each controller individually or all controllers globally.

In case of a communication failure, each site controller shall work in an off-line mode until communication is restored. Each controller shall store up to 5,500 transactions and 4,000 vehicles/device with the ability to set limitations and restrictions.

When communication is established again, the system shall synchronize data automatically.

The site controller shall have a high-level data protection through one (1) isolated TCP/IP ethernet network port.

The site controller shall have the following additional capabilities:

- Secure remote access capabilities for monitoring, management and maintenance activities.
- Flexible with several types of communication including cellular, ethernet and WiFi
- Web enabled reporting and alarms for Automatic Tank Gauging Systems (ATG) either Fluid Management Technology Smart Dip or pass through of Veeder Root-protocol.
- Web based fuel management reporting for reconciliation report.
- Accessible via Internet browser to control and monitor the system. No dedicated hardware or software shall be required.
- Real time web-based monitoring and control of dispensers.

- Remote operation of pumps and control of transactions.
- Ability to update fuel prices.
- Remote maintenance, remote troubleshoot and remote firmware upgrades of the various components of the system.
- A USB port to be used for either manual data transfer or manual system update or manual synchronization.
- An API will be available for interfacing with existing enterprise software.

The system shall store transaction data as well as driver and vehicle records into its database using solid state storage. Other critical data such as fueling limits and restrictions shall also be stored in the database.

The system shall use the following authorization devices:

- Key fobs
- Optional Magnetic swipe cards
- Keyboard entry
- Optional HID reader
- Fleet cards
- Optional Automatic Vehicle Identification using SmartTag (See section 5.3)

Authorization schemes shall include the following scenarios:

- Single device authorization
- Two stage authorization (based on two authorization devices)
- Add-on keyboard entries: PIN code, vehicle ID, odometer reading, engine hours

Each controller shall have the ability to set limitations and restrictions based upon:

- Vehicle
- Driver
- Odometer
- Hour meter
- Fuel type
- Day of the week
- Time of day

The system shall have the option to collect data from driver before refueling, such as: PIN, Odometer, vehicle ID, etc.

The system shall provide odometer reasonability checks

The site controller shall allow the possibility to work offline with all limits and restrictions

#### **4.2 Pump Protocols**

The site controller, with the applicable modules, shall support the following pump protocols:

- Pump Relay
- Gilbarco
- NZ / PEC
- Wayne
- Tatsuno

#### **4.3 Tank Level Sensing (TLS) Interface**

The site controller shall support Veeder Root TLS 350 protocol or Veeder Root TLS 450 protocol.

The TLS will be connected to the site controller via a TCP/IP communication or a serial port to allow fuel management capabilities

The site controller, with the applicable, optional module(s), can collect the following data from TLS equipment:

- 12:01 AM dip
- Tank inventory level
- Fuel delivery information

#### **4.4 Pedestal**

The pedestal shall be an epoxy coated metal designed for easy installation and service.

The pedestal shall allow access for maintenance and wiring and shall enable flexible installation on the fueling island.

#### **4.5 Receipt Printer**

An outdoor receipt printer shall be available as an option.

#### **4.6 Software, firmware, access fees**

- There shall be no upfront licensing fees.
- There will be no monthly access fees.
- There will be no firmware maintenance fees.
- Basic data shall be available at no charge.
- If required, advanced reporting shall be available for a yearly or monthly additional fee.



## **5.0 Peripherals**

The following optional modules shall be available:

### **5.1 *Vehicle telematics module for OBDII***

The following types shall be available:

The OBD II module shall be miniature plug-in wireless devices requiring no external power connection. The micro modules shall plug in into the vehicle diagnostic connector (OBD) intended for light duty vehicles.

Software updates to the vehicle data bus modules shall be accomplished through the site controller.

The vehicle module shall be capable to be installed on any vehicle type

The vehicle data bus modules shall be easily installed by non-technical personnel.

### **5.2 *Universal vehicle telematics module***

The universal vehicle module shall be a miniature wireless device. The module shall be wired to the vehicle's data bus and will be able to connect to older vehicle.

### **5.3 *Automatic Vehicle Identification***

Automatic Vehicle Identification shall be available using SmartTag. The SmartTag reader shall be attached to the fuel nozzle and automatically detect a vehicle tag fixed to the vehicle.

A Comms Wireless module shall allow the SmartTag reader to transmit the vehicle tag number back to the site controller to authorize dispensing of fuel.

## **6.0 Programming**

No additional hardware shall be required to program all the system devices.

The site controller shall be capable of programming the vehicle data modules.

## **7.0 Website Capabilities**

### **7.1 *General***

No application software is required

The website shall support multiple fuel site controllers and allow data consolidation.

The website shall support multiple fleets and multiple departments.

The website shall synchronize data with all sites.

The website shall be used as a centralized issuing and programming facility for vehicle data modules, key tags, swipe cards, proximity cards, etc.

The system shall be a centralized web server communicating with all sites to provide a centralized database and on-line network access for fleet managers, key personnel and remote maintenance entities.

The website shall communicate with all sites to provide 24/7 on-line access through the network.

The website shall create and control several fleets and departments and support different privilege levels for limited access for different users (for example, a specific user shall only be able to view transactions, and not manage vehicles).

The website shall provide advanced on-line services for multiple sites and multiple fleets in a region.

The host website shall use SSL security.

The web server shall provide secure log-in through a web browser for each fleet manager, for monitoring & control and report generation including exception reports.

The website shall allow exporting data to different file formats (using a dropdown menu) such as CSV, PDF, and XLSX.

The user interface for all website components shall be a web browser.

## **7.2 Limits and Restrictions**

Host website shall allow limits and restrictions to be configured either by an authorized user or imported from a different external system (using the import/export).

The rules shall be transferred to every site controller to enable off-line activity in case of communication failure; hence a fuel site will be able to refuel a vehicle within its set of limits and restrictions, when communication is down.

The limits shall be downloaded into the site controller at a predefined time or for a predefined period. Site controllers can also use the limits in an off-line mode (in case of communication failure).

There shall be a grace period (parametric) for this off-line mode since the vehicle could refuel also in other sites (above its limits) while the sites are disconnected from the cloud.

## **7.3 Fuel Management System Website**

The web server hosted on Amazon Web Services, shall collect the transactions and tank level sensor information from all fuel sites for centralized fuel management activities including required deliveries, forecasting, reconciliation and more for optimal usage of fuel.

The system shall provide the following capabilities:

- Reports regarding fuel consumption with filters of sites, dates, volumes and more
- Customized templates for specific reports
- History of fuel consumption from every product with graphical representation
- Forecasting consumption for every product based on the consumption history with graphical representation
- Reconciliation
- Manual entry or editing of fueling transactions
- Provide unified view of ALL stations with regards to fuel level status
- Provide consolidated view of each specific fuel tank, per station
- Provide a centralized system for maintenance reporting and reporting of different system alarms, per station
- Provide an interface for managing of manual stations (without Fuel Controllers)

Tanks status screen from TLS system per site with graphical representation of the tanks

Alarms (High/Low tanks level, Leak detection, No communication, Etc.)

Export capabilities to other systems (ERP)

## **8.0 Reporting System**

Consolidate data from multiple stations and generate fuel management reports.

### **8.1 Summary Report**

Summarizing all transactions of a specific fleet of vehicles.

### **8.2 Vehicle Report**

Offering the Fleet Manager, a detailed transaction report of vehicles pertaining to his fleet, in three cross sections:

**Transactions** - providing information regarding each transaction, including *the vehicles identification, odometer reading, fuel type, fuel volume and the transaction ID.*

**Consumption** - listing information regarding each vehicle (device) providing a summation of data (volume consumption, fuel cost, other costs) for each vehicle in a specified time frame.

### **8.3 Fuel Management System Reports**

#### **Sales Reports**

Sales by Tanks Report

#### **Reconciliation Report**

Local Account Transactions

Pump-wise Delivery Report  
Product-wise Dispenser Delivery  
Fuel Sales Trends Graph  
Fuel Volume Forecast Report

Tank Reconciliation Trends

**Maintenance Reports**

Exception Log Reports  
Alarm Duration Reports

**Stock Data Reports**

Tanks by Sites  
Tanks Trends Graph  
Total Wet Stock Report

**Vehicle Reports**

Service Report  
Consumption Report  
Trip Consumption Report

**9.0 Backup**

The system shall provide several back-up mechanisms for maximal data protection as follows:

The database is transmitted periodically to the web server. Database backups are performed incrementally every 5-10 minutes, in addition to a full daily backup.

Built-in database back-up mechanism.

All transactions may be exported through the standard USB port.

**10.0 Warranty**

12 months system Parts and Labor warranty.