IN THE COUNTY LEGISLATURE OF JACKSON COUNTY, MISSOURI

A RESOLUTION awarding a contract for the purchase of a Fuel Master fuel management system for use by the Road and Bridge Division of the Public Works Department to Syn-Tech Systems, Inc., of Tallahassee, FL, under the terms and conditions of the National Joint Powers Alliance Contract No. 052109, an existing government contract, at an actual cost to the County not to exceed $82,587.25.

RESOLUTION #17395, October 18, 2010

INTRODUCED BY Bob Spence, County Legislator

WHEREAS, the County's Road and Bridge Division of the Public Works Department has a need for a new Fuel Master fuel management system to update its current fueling system, which is obsolete and in disrepair; and,

WHEREAS, the Director of Finance and Purchasing recommends the award of a contract for this purchase to Syn-Tech Systems Inc. of Tallahassee, Florida, under the terms and conditions of the National Joint Powers Alliance Contract No. 052109, an existing government contract, at an actual cost to the County not to exceed $82,587.25; and,

WHEREAS, the Director recommends award under section 1030.4, Jackson County Code, 1984, for the reason that this will allow the County to take advantage of discounts offered to large entities; now therefore,

BE IT RESOLVED that award be made under the existing government contract as recommended by the Director of Finance and Purchasing and that the Director be, and is hereby, authorized to execute for the County any documents necessary for the

accomplishment of the award; and,

BE IT FURTHER RESOLVED that the Director of Finance and Purchasing be and hereby is authorized to make all payments, including final payment on the contract.

Effective Date: This Resolution shall be effective immediately upon its passage by a majority of the Legislature.

APPROVED AS TO FORM:

Chief Deputy County Counselor

Acting County Counselor

Certificate of Passage

I hereby certify that the attached resolution, Resolution #17395 of October 18, 2010, was duly passed on October 25, 2010 by the Jackson County Legislature. The votes thereon were as follows:

Yeas 8 Nays 0

Abstaining 0 Absent 1

10·25·10

Date

Mary Jo Spino, Clerk of Legislature

There is a balance otherwise unencumbered to the credit of the appropriation to which the expenditure is chargeable and there is a cash balance otherwise unencumbered in the treasury to the credit of the fund from which payment is to be made each sufficient to provide for the obligation herein authorized.

ACCOUNT NUMBER: 004 1506 56080
ACCOUNT TITLE: Special Road and Bridge Fund
Road and Bridge Maintenance
Other Professional Services
NOT TO EXCEED: $75,673.00

ACCOUNT NUMBER: 004 1506 56570
ACCOUNT TITLE: Special Road and Bridge Fund
Road and Bridge Maintenance
Maintenance and Repair-Misc.
NOT TO EXCEED: $ 6,914.25

October 13, 2010

Date

Director of Finance and Purchasing

REQUEST FOR LEGISLATIVE ACTION

Completed by County Counselor's Office:
Res~~Ord~~ No.: 17395
Sponsor(s): Bob Spence
Date: October 18, 2010

SUBJECT	Action Requested ☒ Resolution ☐ Ordinance Project/Title: Requesting authorization of the purchase of a Fuel Master® Fuel Management System for use by the Road & Bridge Division of the Public Works Department to Syn-Tech Systems Inc. of Tallahassee, Florida, in the amount of $82,587.25 under the Terms and Conditions of the National Joint Powers Alliance Contract No. 052109, an existing government contract.
BUDGET INFORMATION *To be completed By Requesting Department and Finance*	

Amount authorized by this legislation this fiscal year:	$82,587.25
Amount previously authorized this fiscal year:	$
Total amount authorized after this legislative action:	$82,587.25
Amount budgeted for this item * (including transfers):	$82,587.25
Source of funding (name of fund) and account code number; FROM	FROM ACCT
004-1506-56080, Road & Bridge, Public Works-Maintenance, Heavy Machinery & Equipment	$75,673.00
004-1506-56570, Road & Bridge, Public Works-Maintenance, Maintenance & Repair – Misc.	$ 6,914.25
TOTAL	$82,587.25

* If account includes additional funds for other expenses, total budgeted in the account is: $

OTHER FINANCIAL INFORMATION:

☐ No budget impact (no fiscal note required)
☐ Term and Supply Contract (funds approved in the annual budget); estimated value and use of contract:
Department: Estimated Use: $

Prior Year Budget (if applicable): N/A

Prior Year Actual Amount Spent (if applicable): N/A

PRIOR LEGISLATION	Prior ordinances and (date): N/A Prior resolutions and (date): N/A
CONTACT INFORMATION	RLA drafted by (name, title, & phone): Teddy Ballard, Senior Buyer, 881-3465
REQUEST SUMMARY	The Road & Bridge Division of the Public Works Department is requesting the purchase of a new Fuel Master® Fuel Management System to update their current fueling system which is obsolete and parts are no longer available for repairs. This fueling system is compatible with our existing fleet management software and compared to other systems is lower in acquisition and maintenance costs. This Fuel Master® System is identical to the fueling system the City of Kansas City, Missouri, currently utilizes; in the event of a disaster, we would be able to link up with the City of Kansas City, Missouri, if necessary. Pursuant to Section 1030.4 of the Jackson County Code 1984, the Director of Finance and Purchasing recommends the award of a Fuel Master® Fuel Management System for use by the Road & Bridge Division of the Public Works Department to Syn-Tech Systems Inc. of Tallahassee, Florida, in the amount of $82,587.25

	under the Terms and Conditions set forth in the following existing government contract: Recommended Vendor Syn-Tech Systems Inc. Tallahassee, Florida Contract Number National Joint Powers Alliance Contract Number 052109	
CLEARANCE	☐ Tax Clearance Completed (Purchasing & Department) ☐ Business License Verified (Purchasing & Department) ☒ Chapter 6 Compliance - Affirmative Action/Prevailing Wage (County Auditor's Office)	
ATTACHMENTS	National Joint Powers Alliance Contract No. 052109, Requisition No. RE321156452, and the Fuel Master® Quote from Syn-Tech Systems Inc.	
REVIEW	Department Director:	Date:10/05/2010
	Finance (Budget Approval): *If applicable* Mary Rasmussen	Date: 10/7/10
	Division Manager:	Date: 10/7/10
	County Counselor's Office:	Date:

Fiscal Note:

This expenditure was included in the Annual Budget.

Date: October 7, 2010

RES # 17395

Department / Division	Character/Description	Not to Exceed
Special Road & Bridge Fund - 004		
1506 - Road & Bridge Maintenance	56080 - Other Professional Services	75,673.00
1506 - Road & Bridge Maintenance	56570 - Maint. & Repair - Misc.	6,914.25
	Total	82,587.25

Mary Rasmussen
Budgeting 10/7/10

J.

Bid Offering
And Acceptance and Award
IFB #052109

FORM D

FLEET MANAGEMENT TECHNOLOGIES,
Bid Offering (To be Completed Only by Bidder)

In compliance with the Invitation for Bid (IFB) for FLEET MANAGEMENT TECHNOLOGIES, the undersigned warrants that I/we have examined the IFB and, being familiar with all of the instructions, terms and conditions, general specifications, expectations, technical specifications, service expectations and any special terms, do hereby offer and agree to furnish the defined products and services in compliance with all terms, conditions of the IFB, any applicable amendments of this IFB, and all Bidder's response documentation. Bidder further understands they are the sole offeror herein and that the performance of any sub-contractors employed by the Bidder in fulfillment of this offer is the sole responsibility of the Bidder.

Company Name: Syntech Systems Date: 5/20/09

Company Address: 100 Four Points Way

City: Tallahassee State: FL Zip: 32305

Contact Person: Frank Mc Gorgan Title: Vice President Sales + Marketing

Authorized Signature (ink only): _____ (Name printed or typed)

Contract Acceptance and Award (To be completed only by NJPA)

Your bid offering is hereby accepted and awarded. As the awarded Bidder, you are now bound to provide the defined goods and services contained in your bid offering according to all terms, conditions, and pricing set forth in the IFB, any amendments to the IFB, and the Bidder's Response. The term of the Contract shall commence on the date of this award and continue for four years AND which is subject to annual renewal at the option of both parties.

National Joint Powers Alliance® (NJPA)

NJPA Authorized signature: _____ Gary L. Nytes (Name printed or typed)

Title: Executive Director NJPA

Awarded this 7/17/09 day of _____ **Contract Number # 052109-585**

NJPA Authorized signature: _____

Title: _____

Executed this 28th day of May 2009 **Contract Number # 052109P**

FUEL MASTER®
FUEL MANAGEMENT SYSTEM

Pricing for contracts that come from the National Joint Powers Alliance® (NJPA) will be discounted 10% off the attached FUELMASTER® pricing schedule.

Frank McGoogan

Frank McGoogan
Vice President for Sales and Marketing

Syn-Tech Systems, Inc.
100 Four Points Way
Tallahassee, FL 32305

marketing@syntech-fuelmaster.com
www.syntech-fuelmaster.com

800-888-9136
850-878-2558
(fax) 850-877-9327

FUEL MANAGEMENT SYSTEM

National Joint Powers Alliance®
Attention: Greg Meierhofer
200 First Street Northeast,
Staples, MN 56479

Syn-Tech Systems, Inc. would like to provide additional pricing information to its bid offering to the National Joint Powers Alliance (NJPA) Invitation for Bid.

Equipment pricing is provided on the accompanying Syn-Tech Systems, Inc., FUELMASTER® Pricing catalog. Pricing for installation and training was not listed on the pricing catalogs but is described and provided here.

Prior to FUELMASTER® technician arriving, the site should be prepared by having wiring run in electrical conduit from each dispenser to the FMU location as well as power (115VAC) and communications wiring. A site planning guide is attached for information on conduit runs and to explain system operation. If no existing FMU is on the fuel island, conduit should be installed in accordance with the system planning guide. Most Government agencies have an electrician who can provide installation of conduit and wiring. In some cases, wireless RF systems may be purchased in lieu of trenching and running conduit and wire.

Installation of a FUELMASTER® fuel island FMU is $2500 for the first FMU and $2000 for each additional FMU at a site. This includes replacing an existing fuel management unit by removing the existing unit, installing the FUELMASTER®, wiring the FMU to power, an analog, voice-grade phone line or LAN connection, to the dispensers, and tank monitor console, and providing software training.
If the customer is purchasing AIM2 equipment, the charge for a technician to train the organization's mechanics on AIM2 installation is $3995. This includes the installation of at least 5 AIM2 modules on different types of equipment.

The pricing above does not include site preparation which consists of cutting concrete and installing conduit and wire. This does not include pulsers or valves if required. Normally valves are not required. Some dispensers already have pulsers; however, those that do not will need a pulser. Pulsers can be purchased for approximately $300 depending on the dispenser make and model.

If there are any questions, please do not hesitate to call.

Sincerely,
Syn-Tech Systems, Inc.

Frank McSorgan

Accepted and authorized by the
National Joint Powers Alliance
By:
Gary L. Hayes Executive Director
Required to pay sales and use taxes on purchase

Syn-Tech Systems, Inc.
100 Four Points Way
Tallahassee, FL 32305

marketing@syntech-fuelmaster.com
www.syntech-fuelmaster.com

800-888-9136
850-878-2558
(fax) 850-877-9327

ofec.
10-27-09

Frank McGoogan
Vice President for Sales and Marketing

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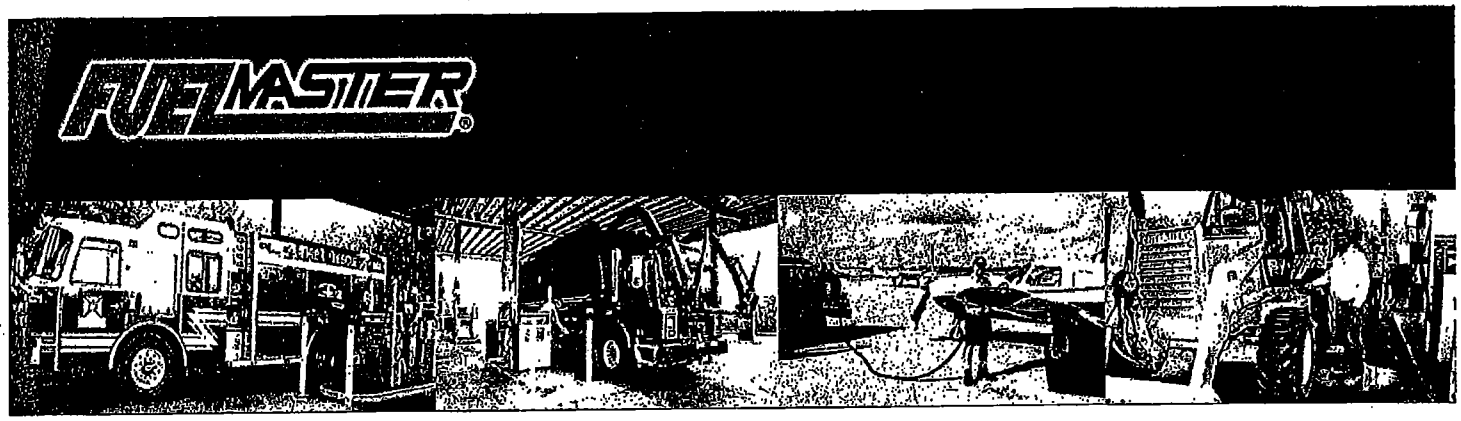


The ***FuelMaster®*** **System Planning Guide** is provided to project requirements for a ***FuelMaster®*** Fuel Management System. This guide is not to be used as a reference for installation of ***FuelMaster®*** Products. An installation manual will be provided for reference during installation.

To assure optimum performance, all ***FuelMaster®*** Fuel Management Systems must be either installed or initialized (certified) by Syn-Tech Systems' factory trained personnel. Final certification must be accomplished jointly by the Customer and Syn-Tech factory trained personnel. Contact your ***FuelMaster®*** salesman or call Syn-Tech Customer Support (1-800-888-9136) for assistance with any questions not adequately addressed in this guide.

SYSTEM DESCRIPTION. ***FuelMaster®*** Fuel Management Systems consist of equipment designed to automate control and accountability of fuel or any metered liquid or gas product.

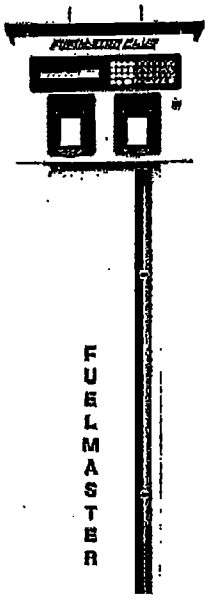
The base system contains all equipment necessary to accomplish control and accountability and consists of a fuel island controller called a Fuel Management Unit (FMU), Windows software for your PC (Central Controller), some type of access device, e.g. credit cards, Smart Cards, read/write keys (PROKEES®), proximity cards / tags, or small computers that are installed on your vehicles (Automotive Information Modules or AIMs), and installation and operations manuals.

The Central Controller communicates with the FMU through an installed Network Interface Card (NIC) or voice grade analog telephone line to download transactions and upload access lists.

EQUIPMENT DESCRIPTION. The Fuel Management Unit (FMU) controls access to fuel dispensers and collects information on each transaction. FMUs may be fixed or mobile. Fixed FMUs are permanently mounted on or near the fuel island. Each fixed FMU comes standard with two hose controllers, but may have hose controllers added up to a total of eight.

A master FMU contains a modem/NIC for communications with the Central Controller and controls all connected Satellite FMUs. Master FMUs and Satellite FMUs are identical in appearance and manner of operation; however, the Satellite depends on the Master for information and also its transactions are downloaded through the Master FMU's modem/NIC. A Master can control up to a maximum of eight Satellites.

Different access devices may be used to activate a dispenser. FMUs are built according to a customer's needs and can accept up to five different access devices. Read/write keys (PROKEES®) and cards (Smart Cards) are the most frequently used devices and are encoded using ***FuelMaster®*** software and an encoder that connects to the PC's USB port. Credit cards, proximity cards / tags and on-board computers that transmit data by radio frequency may also be used.



Fuel Management Unit (FMU)

MOBILE FMUs are mounted on fuel dispensing tanker trucks/equipment and operate with the same displays and keypad selections as the fixed FMUs. Mobile FMUs are powered by the vehicle's 12 VDC battery. Optionally, a NIC can be used. Mobile FMUs can control up to four hoses, although the standard unit has one hose controller.

Passive Mobile Unit

PROKEES® (also referred to as Keys) are ***FuelMaster's®*** unique access device provided to initiate a transaction at the FMU (Fixed or Mobile). All PROKEES® are constructed alike with an eight pin read/write memory chip housed in a durable composite holder. PROKEES® attain their identity as a Vehicle Key, User Key, Supervisor Key, Manual Issue Key, or Tanker Truck Key as they are encoded with the software and encoder. PROKEES® are available in black, white, orange, red, blue, and green. SmartCards are encoded and function exactly as PROKEES®, and a ***FuelMaster®*** system can accept either PROKEES® or SmartCards, mag stripe cards or proximity cards.

PROKEES®

- *Vehicle Keys* are encoded with a vehicle identification number and are assigned to a vehicle. These keys can keep the vehicle's last odometer reading and the range in which the next reading should be. The type of fuel and quantity limit for the vehicle ensures that only the correct product(s) can be dispensed into the vehicle.
- *User Keys* are encoded with a user identification number and are assigned to a user.
- *Supervisor Keys* are authorized special access to reconfigure the FMU, run built-in tests of the FMU, issue fuel to operators without a PROKEE®, and enter inventory.
- *Manual Issue Keys* are used to issue fuel to individuals or vehicles that do not have a PROKEE® or other access device.
- *Tanker Truck Keys* are used to fill the storage tank of a mobile fueling truck at a dispenser connected to an FMU.

FUEL MANAGEMENT SOFTWARE. ***FuelMaster®*** Windows Software is loaded on a PC and used to download transactions from, and upload information to, FMUs; provide reports using Crystal Reports; export data to fleet maintenance programs; and encode and update PROKEES® available in MS Access/Sequel databases.

The operating program is available in three basic configurations: Verifiable Miscellaneous Number (VMN), Verifiable Vehicle Identifier (VVI), or Commercial (COM) version. The VMN version utilizes Vehicle Keys and accepts the keypad entry of only those ID numbers loaded into the FMU. The VVI version utilizes User Keys and accepts only those vehicle numbers loaded into the FMU. The COM version utilizes Vehicle and/or User Keys and, through keypad entry, records the input of a vehicle or user identification number. Because it does not contain a look-up table for these numbers, it accepts the entry of any number.

The **CENTRAL CONTROLLER** *(main computer holding FuelMaster® database)* communicates with the FMU to download transaction data, upload authorizations, or to change FMU configuration. The Central Controller may be any IBM or IBM compatible personal computer (PC) having at minimum 400MHz Processor or equivalent, 512Mb of RAM, 150Mb free hard drive space, 12x CD-ROM, 33.6K analog modem (must be 100% Hayes compatible), and 1024 x 768 screen resolution, a serial port, network connection, USB or parallel port for encoding and WinXP® Professional Operating System SP2 or SP3.A PC and modem are not included with the base ***FuelMaster®*** system, but may be ordered through Syn-Tech Systems as part of a total package. Call ***FuelMaster®*** for SQL server requirements.

The PROKEE® ENCODER uses data entered in the *FuelMaster®* software to encode, update, or re-encode PROKEES®. The encoder is also used to read data from a PROKEE® and update the odometer, preventive maintenance mileage, etc. The encoder connects to the PC's parallel or USB port.

PROKEE® Ecoder

SYSTEM OPTIONS. The following system options are available with a *FuelMaster®* purchase or as a future upgrade:

- **DIRECT-CONNECT.** If the fuel island FMU is located near the Central Controller, you may want to directly connect the two to avoid using two telephone lines. A small black box (ring down box) is positioned between the FMU and the PC to allow the modems in each to talk to one another.

- **DIRECT CONNECT CABLE.** A direct connect cable permits connection directly to an FMU with a laptop computer without installing a Viking box inline. A Viking box requires an AC outlet for its power supply.

- **ON-SITE PRINTER.** An on-site, real-time serial printer may be connected to the Master FMU to print a record of each transaction as it occurs. The on-site printer can also provide limited report and configuration information.

- **RECEIPT PRINTER.** The Receipt Printer on the FMU prints a receipt of the transaction including system owner name, date, time, user ID, Vehicle ID, hose, product, price, and quantity. Additional customer information may be programmed for printing.

- **DATA LOGGER.** The data logger may be installed in any FMU to electronically capture transactions on removable SecureDigital (SD) media. Over 3 million transactions can be stored on a 1GB SD card in a circular buffer by date. The card can be removed and read by inserting it into a PC card reader slot, or the contents of the card can be viewed by connecting to the FMU using off-the-shelf commercial software. It can be used in lieu of an onsite printer.

- **TANK MONITOR INTERFACE.** A serial connection between the FMU and tank monitor permits the *FuelMaster®* software to query the tank monitor and bring inventory reconciliation and leak detection information back to your PC. The list of tank monitor interfaces changes as new ones are added; however, the following are some of the tank monitors with which *FuelMaster®* interfaces:

Autostik	Autostick II/ Jr
EMCO TLM-II	Red Jacket 5000/5001
Veeder-Root Series	Ronan X76
Image	Incon TS-1000/TS-2000
J&J 1100/8100	Pneumercator LMS-700
Omntech	Pneumercator LMS 740/750
Gilbarco TM2/TM3/EMC/ATS	Petrosonic III
Soil Sentry TLM-830	

- **EQUIPMENT INTERFACE UNIT (EIU).** The EIU is a low cost Satellite FMU that is installed primarily as a gate opener. The EIU activates an electronic gate with either keypad entry or PROKEE® access, depending on the system type.

- **AUTOMOTIVE INFORMATION MODULE (AIM^2).** AIM^2 is an RFID system installed on a vehicle and programmed with information about the vehicle, as well as collecting odometer, chronometer, engine error codes and other information. Information on the vehicle is transmitted by radio frequency from the AIM^2 unit to the FMU 3500. Information is collected during fueling without driver involvement.

AIM^2 Unit Installed

  - Ensures proper fuel allocation
  - Prevents cross-fueling with grade-lock feature

- **REMOTE DATA COLLECTION UNIT.** The RDCU is used in conjunction with Automotive Information Modules (AIM^2) to collect direction of travel (ingress and egress) information as vehicles transit gates, parking areas or maintenance bays. The APM can also gather vehicle health data; such as, mileage, battery voltage, engine error codes and other data.

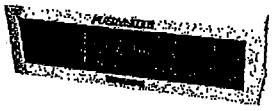
RDCU Unit

- **PROXIMITY TAG READER.** Any FMU can be equipped with a low profile proximity card/tag reader to read proximity tags/cards in the Wiegand bit stream format. The FMU will extract the Site ID and Card ID from the proximity tag/card. Contact Syn-Tech Systems for specific data required.

- **CREDIT CARD ACCESS.** A Master FMU may be equipped to read most popular fleet, aviation, and standard credit cards. Contact Syn-Tech for a list of networks and credit cards. A credit card system must have a dedicated voice grade, analog phone line.

- **QUICK STOP BUTTON.** Fixed FMUs may be equipped with a resettable quick stop button to quickly remove (and restore) power from (to) the FMU. If wired into a controlling contact starter, the quick stop button may be used to remove power from the entire service island.

- **LARGE REMOTE DISPLAY/PULSE DELAY CIRCUIT**
Long fueling hoses force dispensing equipment to register fuel quantity before any fuel can be dispensed from the fuel nozzle. This is unacceptable to Weights & Measures agencies and paying fuel customers. The Large Remote Display and Pulse Delay Circuit delays registering fuel quantity until the hose is fully charged. Then all recorded fuel matches the fuel actually dispensed from the fuel nozzle.



Large Remote Display

- **NETWORK COMMUNICATIONS.** Communications between the FMU and Central Controller is available via cable, fiber optic, or wireless network communications in addition to telephone and direct connect cable communications.

- **SYSTEM SOFTWARE OPTIONS.** *FuelMaster®* has numerous options that can be activated by either the system operator or a *FuelMaster®* technician. A few of the many available options are:

  - *Odometer Entry.* Prompts user to enter odometer/chronometer for vehicle efficiency reporting and/or Preventive Maintenance tracking.

  - *Preventive Maintenance.* Reminds user that Preventive Maintenance (PM) is due for vehicle being fueled. The PM range is selectable by system owner.

  - *P.I.N.* (Personal Identification Number). Prompts user to enter a PIN when initiating a transaction. Just as with an ATM card, the four-digit PIN only works with its assigned PROKEE®. The PIN is not to be confused with the verifiable miscellaneous number which is normally used to identify the driver, can be up to nine-digits long, and can be used with any PROKEE®.

  - *Tanker Truck Operation.* Enables the use of a tanker truck key for mobile fueling or lube operations. The tanker truck becomes a fuel site with accountability for the fuel it dispenses. An FMU can be mounted on the tanker truck to electronically record each transaction.

  - *Semi-manual Operation.* Using a supervisor key, you may activate selected dispenser hoses to permit fueling without a PROKEE®, while still recording the time, date, and amount of each transaction for inventory and billing purposes. This option is primarily used during emergencies, when large numbers of equipment, some of which may not belong to the site operator, require rapid fueling.

  - *Transaction Printer.* The on-site transaction printer provides a real-time hard copy of each transaction as it occurs. Using a supervisor key at the FMU, you can direct the transaction printer to provide some limited, site-specific reports.

  - *Transaction Termination for Incorrect Odometer /Chronometer Entry.* Set FMU to reject odometer/chronometer entry that is not within range specified on the PROKEE®.

  - *Oil Check.* Prompts user to check oil and manually input (through Keypad entry) amount of oil added during the fueling transaction.

  - *Miscellaneous Fields in Vehicle Records.* Each vehicle record in *FuelMaster®* software has five miscellaneous fields that the system operator may elect to use. Each field may be used to differentiate one specific item from one vehicle to another, e.g. on-road vs. off-road purposes, three axle vs. two axle, etc.

Interface and Wiring Requirements

FUELMASTER® is adaptable to any fuel site configuration. In some cases, settings, modifications, and/or accessory equipment may be necessary to ensure compatibility with existing or proposed site equipment. Syn-Tech must be made aware of the following interfaces to ensure the delivered Fuel Management Unit (FMU) is compatible.

1. **Dispenser Control.** The base FMU contains 50 amp solid state relays capable of controlling two hose positions. Additional hose positions (up to 8 per FMU) must be specified in the order. Loads in excess of 50 amps will require added mechanical relays. An Electronic Dispenser Interface Kit is necessary for connections to electronic dispensers.

2. **Pulse Transmission.** FMUs are designed to work with 12 VDC contact closure and open collector pulsers, either filtered or non-filtered. Filtered pulses are limited to 9000 pulses per minute (i.e., a hose with a 100:1 pulser delivering 15 gallons per minute will return 1500 pulses). As many as 120,000 unfiltered pulses per minute may be interpreted, but quality pulser cable must be used and EMF interference must not be present.

3. **FMU-to-PC Communications.** A communications link between the FMU and PC is needed to download transaction data and upload authorization data. Communications are possible with an analog telephone line, wired or wireless network connection, or direct-connect through the use of a two-way ring-down device or direct connect cable.

4. **Data Logger/Transaction Printer.** Real-time captures of transaction data may be collected through an interface with a Data Logger (for electronic copies) or a serial printer (for hard copies). The Data Logger is contained within the FMU. The serial printer connection requires a conduit and RS-232 cable routed between the printer and FMU.

5. **Master Only Applications.** Transaction printers, most credit card interfaces, and tank monitor interfaces are only possible through Master FMUs.

CONDUIT / WIRING REQUIREMENTS

Do not use solid core wire. All conduit must be metal, explosion-proof and installed in accordance with the National Electrical Codes (NEC). Recommended conduit is 3/4 inch. Wire sizes/quantities permitting, a limited number of 1/2 inch conduits may be used. The FMU will support inputs of eight 3/4 inch conduit and four 1/2 inch conduits.

FMUs have minimum power requirements. If powered from the same circuit as equipment with high current loads (i.e., dispensers with, or powering, pump motors) input power to the FMU may drop below the minimum power requirement. FMUs should be powered from a separate power source with a separate circuit breaker rated no less than 15 amps. If a separate FMU power source is not available, contact Syn-Tech Help Desk for alternate wiring methods. Workarounds are available. Recommended FMU power wire is 12 AWG THHN for distances to 400 feet. For greater distances wire size should be increased to 10 AWG.

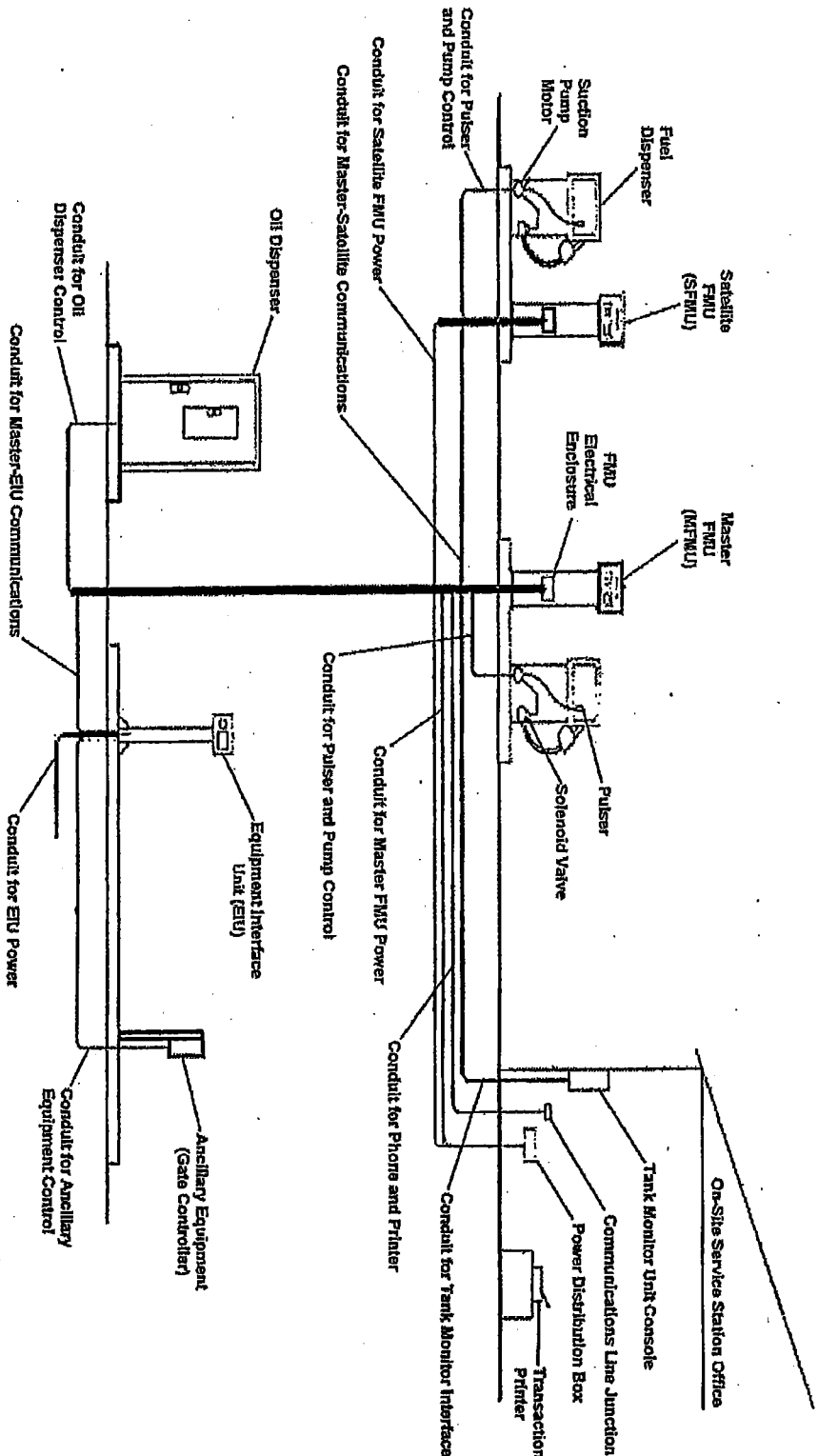
DC pulser wires and AC control wires may be routed through the same conduit providing the pulser wires are shielded and insulated for the maximum power carried through the conduit. Recommended pulser cable is 22 AWG shielded communication cable. Recommended control wire is 14 AWG THHN.

Telephone, direct connect, network, transaction printer, and tank monitor cables/lines may be routed together in the same conduit, but NOT through the same conduit as any AC power wires. For network applications, shielded Cat 5 cable may be used in runs up to 200 feet. At greater distances, fiber optic cables and converters should be used. Use of an easily accessible phone line to the FMU and Central Controller will much improve the availability and timeliness of Syn-Tech Help Desk support, if required. Recommended phone, direct connect, transaction printer, and tank monitor communication cable is 22 AWG shielded CMX (i.e., Belden 8723 2-pair, or equivalent).

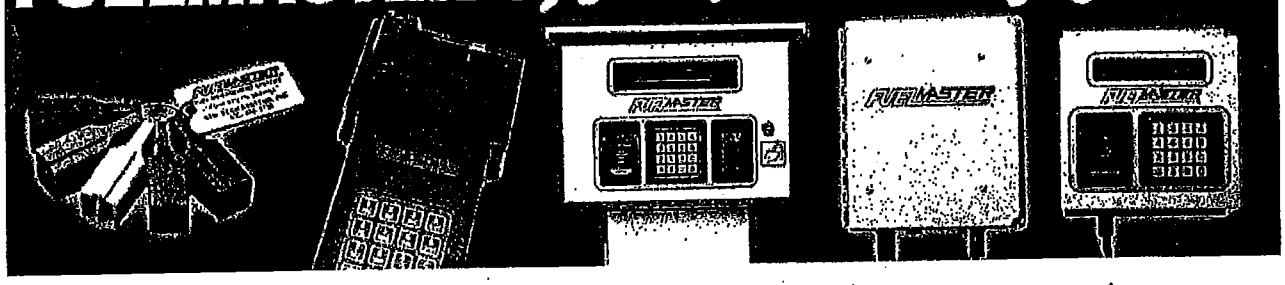
Satellite FMUs may be controlled wireless or via RS-422 communications cable (within 2000 feet of the master FMU). RS-422 connections within 300 feet may use 22 AWG. Distances greater than 300 feet should use 18 AWG.

Tank monitor interfaces may be wireless, or through either RS-232 or RS-422 communications cable between a Master FMU and the TMU console. Follow the TMU manufacturer's recommendations for maximum effective cable length. RS-232 should be used if cable length does not exceed maximum. Use RS-422 and a RS-232/RS-422 converter at the tank monitor for extended lengths. Recommended cable is 22 AWG shielded.

Typical FuelMaster Installation



FUELMASTER System Planning Guide



Interface & Wiring Requirements

FUELMASTER® is adaptable to any fuel site configuration. In some cases, settings, modifications, and/or accessory equipment may be necessary to ensure compatibility with existing or proposed site equipment. Syn-Tech must be made aware of the following interfaces to ensure the delivered FUELMASTER® equipment is compatible.

INTERFACE REQUIREMENTS

1. *Dispenser Control.* The base FUELMASTER® system uses 50 amp relays designed to control dispensers with solenoid valves and/or suction pump motors up to 3/4 horsepower (HP). Loads in excess of 3/4 HP may require added mechanical relays.

2. *Pulse Transmission.* FMUs provide a 12 VDC feed to pulsers, and cannot receive a return pulse greater than 12 VDC. FMUs can interpret up to 9000 pulses per minute (a hose that delivers 15 gallons per minute will return 9000 pulses with a 600:1 pulser (9000/15 = 600). Pulsers that exceed this pulse rate require optical interface adapters (available from Syn-Tech.)

3. *Direct-Connect Systems.* The ring-down box used to provide a direct connection between the FMU and the PC acting as Central Controller has standard RJ11 telephone jacks. The distance between the PC and FMU can be up to two miles. Although regular telephone wire can be used for short distances, Syn-Tech recommends using a shielded Belden 8771 two conductor 18 AWG twisted wire.

4. *Parallel Port Connections.* Rather than using a switching box, Syn-Tech recommends buying a second parallel port. If more than one parallel port is available, the printer must be connected to LPT1 and the encoder to LPT2.

CONDUIT/WIRING REQUIREMENTS

Do not use solid core wire. All conduit must be metal, explosion-proof and utilized in accordance with the National Electrical Codes (NEC). Recommended conduit is 3/4 inch. Wire sizes/quantities permitting, a limited number of 1/2 inch conduit may be used. The FMU will support inputs of eight 3/4 inch conduit and four 1/2 inch conduit.

Like any electrically powered equipment, FMUs have minimum power requirements. If powered from the same circuit as equipment with high power loads (i.e., dispensers with, or powering, pump motors) input power to the FMU may drop below the minimum power requirement. FMUs should be powered from a separate power source with a separate circuit breaker rated no less than 15 amps. If the site construction does not permit a separate FMU power source, contact Syn-Tech Product Support for alternative wiring methods. Workarounds are available. Recommended FMU power wire is 12 AWG THHN.

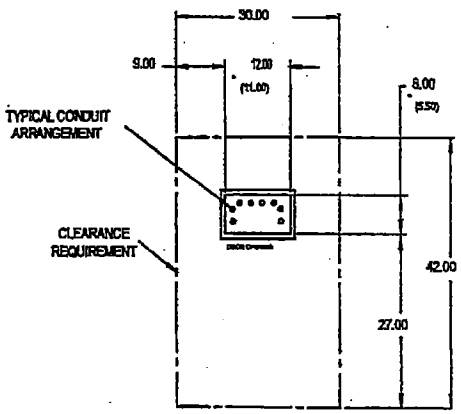
DC pulser wires and AC control wires may be routed through the same conduit providing the pulser wires are shielded and insulated for the maximum power carried through the conduit. Recommended pulser cable is 18 AWG shielded THHN (Belden 8771 2-conductor, Belden 8723 4-conductor, or equivalent). Recommended control wire is 14 AWG THHN.

Telephone (modem) lines to the FMU are NOT to be routed through the same conduit as any power wires. Shielded telephone cable, on-site printer lines, and Tank Monitor Unit RS-232/422 cables may be routed through the same conduit. Final terminations at the FMU or Central Controller modem must be with analog signal telephone lines (digital signal lines cannot ring into a modem; digital signal lines can be converted to analog.) Use of an easily accessible phone line to the FMU and Central Controller will much improve the availability and timeliness of Syn-Tech Customer Support assistance if required. Recommended phone and/or on-site printer cable is 18 AWG CMX (Belden 8771 2-conductor, Belden 8723 4-conductor, or equivalent).

Satellite FMUs may be located up to 2000 feet from the master FMU and will be controlled via RS-422 5-conductor 18 AWG twisted cable (Belden 9552 or equivalent). If RS-422 cable is used, a circuit board must be added to the Master and Satellite FMUs to accommodate the cable connection.

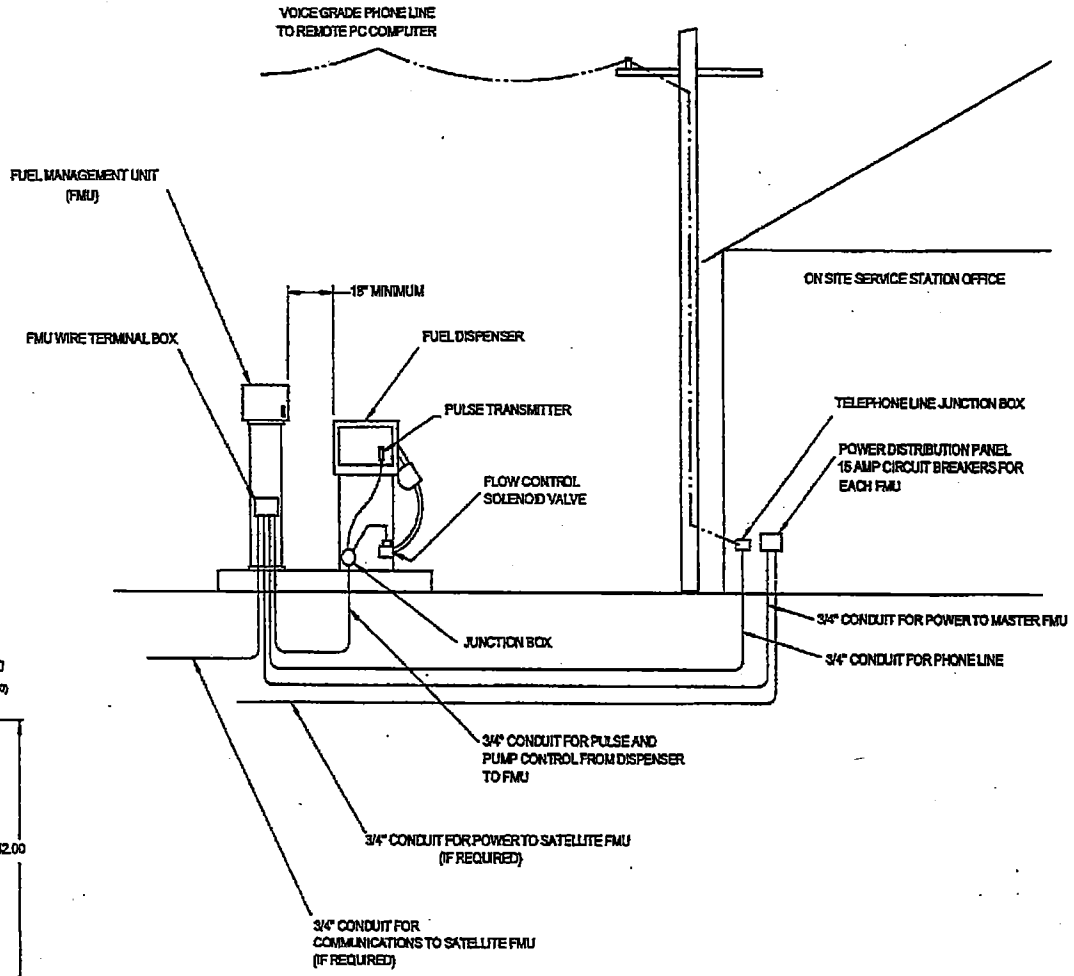
The Tank Monitor Unit (TMU) interfaces are through either RS-232 or RS-422 communications cable between a Master FMU and the TMU console. If a TMU interface is projected, an additional conduit may be necessary to carry the cable and additional circuitry must be added to the Master FMU. Follow the TMU manufacturer's recommendations for maximum effective cable length. Recommended RS-232 cable is 18 AWG shielded (Belden 9341 or equivalent). Recommended RS-422 cable is 18 AWG twisted (Belden 9552 or equivalent).

Typical FuelMaster® Installation



FMU MOUNTING FOOTPRINT
TYPICAL CONDUIT LOCATIONS

ALL CONDUIT MUST LOCATE WITHIN THE 5.50 x 11.00 AREA AS SHOWN
CONCRETE PAD MUST BE LEVEL AND FLAT PRIOR TO FMU PEDESTAL INSTALLATION



Header | Line Items

Document Information

Doc ID: RE 321156452000

Ref ID:

Date: 09/02/10 Copy Only: ☐

Buyer: TNB Send:

Total Amount: 82,587.25

Requester Information

Invoice To: 0145

Requester: WESSING CAROLYN

Dept: 1506

Vendor Information

ID: STS52580

Name: SYN-TECH SYSTEMS INC

Address: PO BOX 5258

Shipping Information

Ship To: 0144

Name: ROAD & BRIDGE MAINT. FACILITY

Address:

34900 OLD US 40 HIGHWAY

OAK GROVE, MO 64075

Ship Via:

Document 1 of 1

OK | Approve | Total | Defaults | Close

Header | Line Items

Document ID: RE 321156452000 Date: 09/02/10 Amount: 82,587.2

Item ID/Description	UOM	Quantity	Price	Amount	I
260-060	MS			75,673.00	☑
TANKS & CONTAINERS	Acct:	004-1506-56080-999-9999-9999-10			
NJPA CONTRACT W/FUELMASTER	SERVICE STATION MODIFICATIONS				
260-060	EA	1	6914.25	6,914.25	☑
TANKS & CONTAINERS	Acct:	004-1506-56570-999-9999-9999-10			
2 YR. MAINT. AGREEMENT -PER NJPA CONT	W/FUEL MASTER-SERVICE STATION MODIFIC				

Summary | Detail

OK | Total | Edit All | Approve | Close

ORDER #

FUELMASTER®
FUEL MANAGEMENT SYSTEMS

Estimate Date:	Customer PO #	Salesperson:
08/19/2010	PAGE 1 OF 3	Mike MacComiskey
		Heartland

ESTIMATE

FOR JORDAN

Sold To:			
PLEASE SELECT:			
JACKSON COUNTY PUBLIC WORKS			
34900 OLD 40 HWY			
City:	St:	ZIP:	CO:
GRAIN VALLEY	MO	64029	
Phone:	817-847-7050		

FOR JORDAN

End User:		KAY MURKLE
JACKSON COUNTY PUBLIC WORKS		
34900 OLD 40 HWY		
GRAIN VALLEY	MO	64029
816-847-7050		

Shipping:		JAMES
PEI OF KC		
1401 E 9TH		
KANSAS CITY	MO	64029
816-421-0022		

Installed by:
Please enter information about system installer in this area

This ESTIMATE is good for 45 days from 08/19/2010

Item	Qty	Retail Per Unit	Discount	Net Price
FMU-3500PLUS: >PROKEE® / RF TAG MASTER UNIT	1	$7,996.00	10.0%	$7,196.40
FMU-3501PLUS: >PROKEE® / RF TAG SATELLITE UNIT	1	$7,685.00	10.0%	$6,916.50
FMU-3535: Passive Mobile Unit- PROKEE ®, RF TAG	1	$7,995.00	10.0%	$7,195.50
227838A-SQL: SEQUEL SERVER SOFTWARE	1	$2,295.00	10.0%	$2,065.50
199001: HOSE CONTROLLER - 50 Amp	10	$195.00	10.0%	$1,755.00
941B0400: AIM 2 KIT-SINGLE TANK VEHICLES	145	$230.00		$33,350.00
941B0400: DUAL TANK KIT	5	$295.00		$1,475.00
172405: Prokee®- Black	50	$4.20	10.0%	$189.00
941D0108: Prokee ® Encoder, USB	1	$550.00	10.0%	$495.00
941B0435: DATA LOGGER	3	$395.00	10.0%	$1,066.50
MANDATORY AIM2 INSTALLATION TRAINING	1	$3,400.00		$3,400.00
PEI INSTALLATIONS	1	$6,500.00		$6,500.00

List Price Subtotal	$74,591.00
Less Discount of:	-$2,986.60
Estimated Shipping Charges:	$495.00
Total This Order:	$72,099.40

Please add additonal instructions or notes in this area:

Enter Notes Here:

ORDER #

FUELMASTER
FUEL MANAGEMENT SYSTEMS

Estimate Date:	Customer PO #	Salesperson:
08/19/2010	PAGE 2 OF 3	Mike MacComiskey
		Heartland

ESTIMATE

FOR JORDAN

Sold To:			
PLEASE SELECT:			
JACKSON COUNTY PUBLIC WORKS			
34900 OLD 40 HWY			
City:	St:	ZIP:	CO:
GRAIN VALLEY	MO	64029	
Phone:	817-847-7050		

FOR JORDAN

End User:		KAY MURKLE
JACKSON COUNTY PUBLIC WORKS		
34900 OLD 40 HWY		
GRAIN VALLEY	MO	64029
816-847-7050		

Shipping:		JAMES
PEI OF KC		
1401 E 9TH		
KANSAS CITY	MO	64029
816-421-0022		

Installed by:
Please enter information about system installer in this area

This ESTIMATE is good for 45 days from 08/19/2010

Item	Qty	Retail Per Unit	Discount	Net Price
941B0444: ANTENNA KIT-PROVIDES EXTERNAL ANTENNA TO AIM	30	$96.00	28.0%	$2,073.60
Select A Product				
Select A Product				
Select A Product				
Select A Product				
Select A Product				
Select A Product				
Select A Product				
Select A Product				
Select A Product				
Precvious balance from Page 1	1	$72,099.40		$72,099.40
DNET Interface	1	$1,500.00		$1,500.00

List Price Subtotal	$76,479.40
Less Discount of:	-$806.40
Estimated Shipping Charges:	$0.00
Total This Order:	$75,673.00

Please add additonal instructions or notes in this area:

Enter Notes Here:

ORDER #

FUELMASTER
FUEL MANAGEMENT SYSTEMS

Estimate Date:	Customer PO #	Salesperson:
08/19/2010	PAGE 3 OF 3	Mike MacComiskey
		Heartland

ESTIMATE

FOR JORDAN

Sold To:

PLEASE SELECT:
JACKSON COUNTY PUBLIC WORKS
34900 OLD 40 HWY

City:	St:	ZIP:	CO:
GRAIN VALLEY	MO	64029	

Phone: 817-847-7050

FOR JORDAN

End User: KAY MURKLE

JACKSON COUNTY PUBLIC WORKS
34900 OLD 40 HWY

GRAIN VALLEY	MO	64029	

816-847-7050

Installed by:

PAGE 3

Shipping: JAMES

PEI OF KC
1401 E 9TH

KANSAS CITY	MO	64029	

816-421-0022

This ESTIMATE is good for 45 days from 08/19/2010

Item		Qty	Retail Per Unit	Discount	Net Price
Select A Product					
Select A Product					
Select A Product					
Select A Product					
Select A Product					
Select A Product					
Select A Product					
Select A Product					
Select A Product					
Select A Product					
Previous balance from Page 1		1	$75,673.00		$75,673.00
SUPER EMA (3 UNITS / PER YEAR)		2	$6,914.25		$13,828.50

List Price Subtotal	$89,501.50
Less Discount of:	$0.00
Estimated Shipping Charges:	$0.00
Total This Order:	$89,501.50

Please add additonal instructions or notes in this area:

Enter Notes Here: