# FluidSecure Installation Instructions

**Installation, Operation and Safety Manual**

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## Safety Information

**<span style="color:red">Warning!</span>**  All wiring should be installed in accordance with local, state and national electrical code requirements under NEC/ANSI/NFPA 70. IMC threaded conduit, sealed fittings and proper electrical wiring practices should be adhered to. Improper installation can result in fire, serious bodily injury or death.

**<span style="color:red">Warning!</span>    Pay attention to the following safety practices**.

1) Never smoke or use an open flame anywhere near the tanks or dispensers.

2) All mechanical joints containing fuel products must be sealed with sealant tape appropriate for the product dispensed.

3) Never use any tools near the dispenser or tanks that can create unexpected sparks

4) Always have a fire extinguisher available in case of fire

5) Always turn off all electrical power when working on any pumps or dispensers.

6) It is highly recommended that someone who is capable of rendering first aid be present during the installation process

7) Follow OSHA lockout/tagout procedures during installation, service and maintenance.

8) Know where the emergency shutoff is located.   Do not use emergency stops to disconnect electrical power.   Always disconnect at the breakers.

9) Always cordon off all work areas from vehicle traffic.

10) The State of California cautions that fuel and fuel handling systems contain chemicals that are known to cause cancer or reproductive harm.

# FluidSecure Link Performance Specifications

| Voltage | 115VAC, 230VAC, 12VDC, 24VDC |
|---|---|
| Power (Link) | 1.5 watts |
| Control | Maximum 3/4hp motor |
| Pulser Input | Dry reed switch or Open Collector |
| Link Comm | WiFi 802.11 |
| Temp | -40 to +80 C (-40 to 176 F) |
| Class | Class 1, Div. 1 |
| Listing | Pending |
| Flow Pulser | +/- 2% |
| External Pulser | Pulser dependent |

The picture below shows the parts that are included with a FluidSecure kit.

Conduit Nipples          1" to 3/4" Reducing Adapter          11/4" to 1" Reducing Adapter



Pulser Cable (External)

LINK

Pipe Tape

Manual Override Switch and Keys
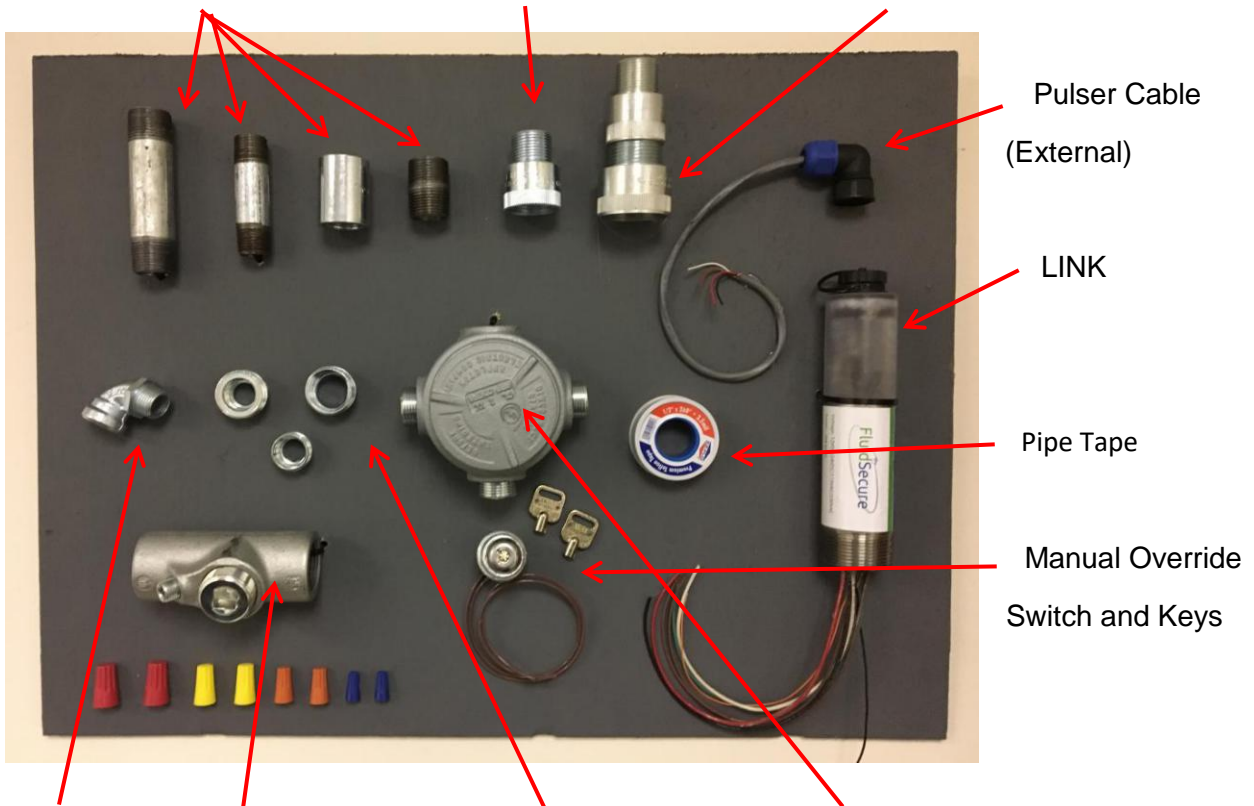
90 Elbow          1" Sealoff          Various Reducing Bushings          3/4" 5 way Junction Box

# A:   Installation - Above Ground Tank

FluidSecure LINK is designed to work with virtually any electrically operated dispenser, pump or solenoid.   There are a large variety of dispensing systems and electrical connections and methods of connecting such devices together. It is not the intention of this manual to cover all possible combinations of connections. This manual will cover a "typical" installation however the installer should be sufficiently proficient in all aspects of dispensing systems to be able to understand how a FluidSecure should be installed and to make sound judgments on how to modify a typical installation to suit the needs for any configuration that may and will be different from a typical one explained here.

## 1) Conduit Connections between Pump and LINK

The FluidSecure kit contains the conduit fittings, bodies and connectors to install the FluidSecure LINK into a typical dispenser/pump.   A typical installation for an above ground tank will look similar to the picture below.
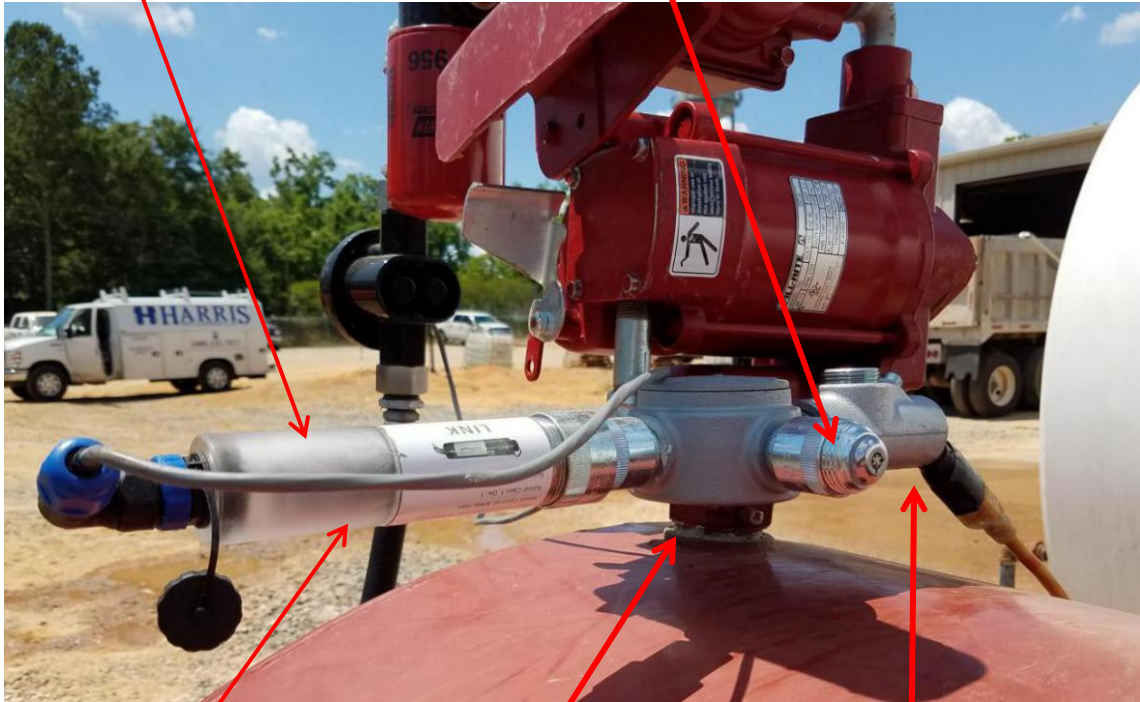
Trak supplied pulser (optional)                                    FluidSecure LINK
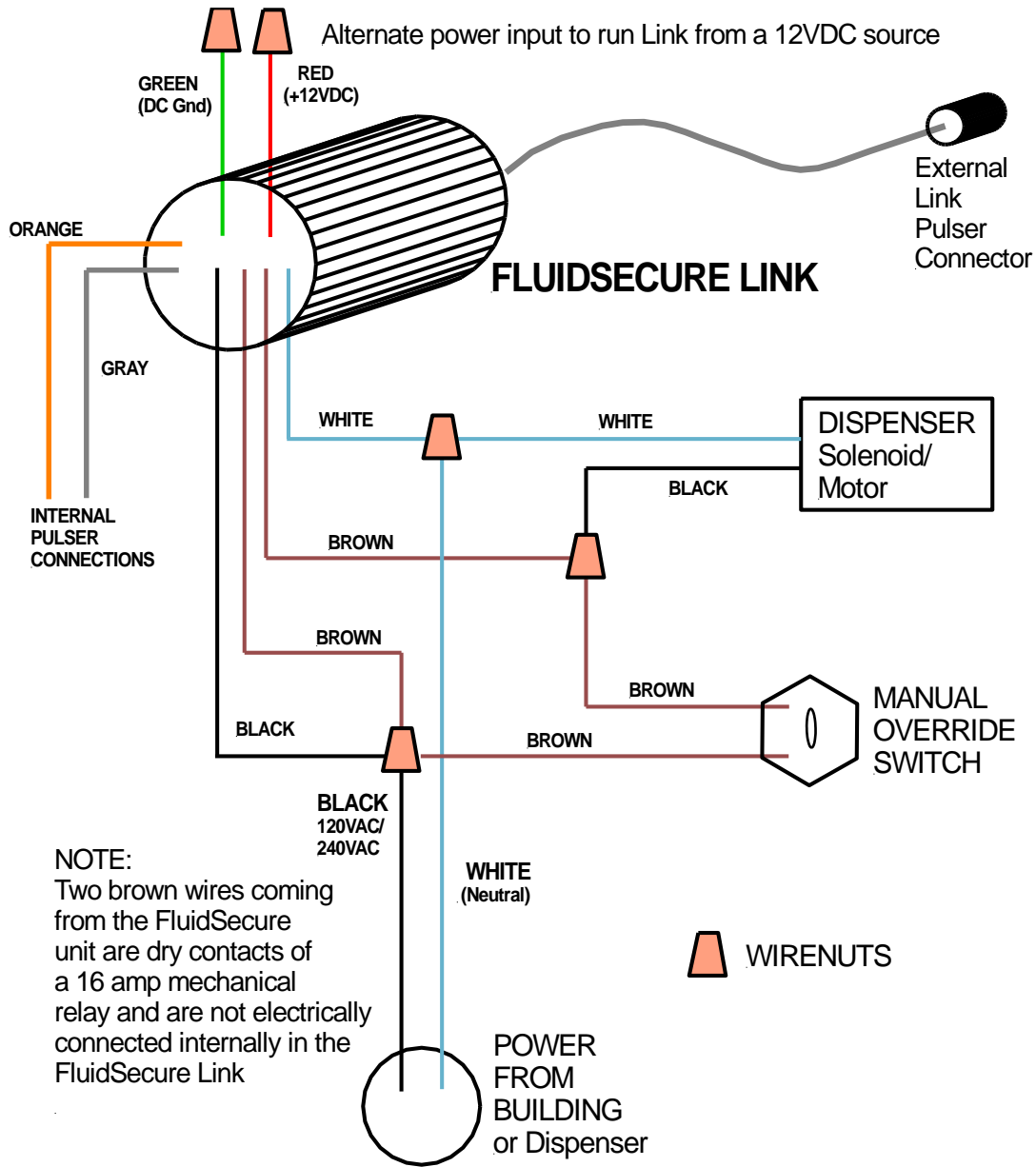
FluidSecure LINK

Manual Override Switch

Wiring Junction Box

Pulser Cable

Conduit Sealoff

## 2) Wiring Connections

The installation typically involves disconnecting the AC power supply wring (generally that comes from a nearby building or power source) from the dispenser and re-routing it through the supplied conduit parts that are supplied as part of the LINK kit and re-connecting the wires to the FluidSecure LINK and dispenser. **Under no condition should a FluidSecure LINK control a pump motor larger than 3/4hp.** Larger loads can be controlled with an external contactor or power relay.

Alternate power input to run Link from a 12VDC source

GREEN (DC Gnd)

RED (+12VDC)

ORANGE

GRAY

External Link Pulser Connector

**FLUIDSECURE LINK**

INTERNAL PULSER CONNECTIONS

WHITE          WHITE

DISPENSER Solenoid/ Motor

BLACK

BROWN

BROWN

BLACK

BROWN

BROWN

MANUAL OVERRIDE SWITCH

BLACK 120VAC/ 240VAC

WHITE (Neutral)

NOTE:
Two brown wires coming from the FluidSecure unit are dry contacts of a 16 amp mechanical relay and are not electrically connected internally in the FluidSecure Link

WIRENUTS

POWER FROM BUILDING or Dispenser

### FluidSecure Link Wiring Diagram

## 3) Pulser Installation

**Two Options:**

**#1 - Trak Supplied Optional Flow Pulser**   Use the optional Trak supplied flow pulser installed between the pump and the hose as seen in prior pictures.. This will involve removing the hose. This guide shows one of several pulser types that may be used with the system. Regardless of the configuration, each flow pulser is marked with an arrow showing the direction of fluid flow. Please note that the optional pulsers are shipped with pre-installed adapters that convert the 1" straight G type thread into a 1" NPT female opening. The adapters are O-ring protected into the pulser. Please ensure that the adapters are secure but do not over tighten.

**Warning!**   Removal of the hose will result in a minor amount of fuel spillage. This can result in a fire hazard and must be handled with extreme care.

- Power to the dispenser must be turned off before attempting.

- Steps must be taken to recover as much of the fuel contained in the hose for return back to the tank.

- A fire extinguisher should be available in case of emergency.

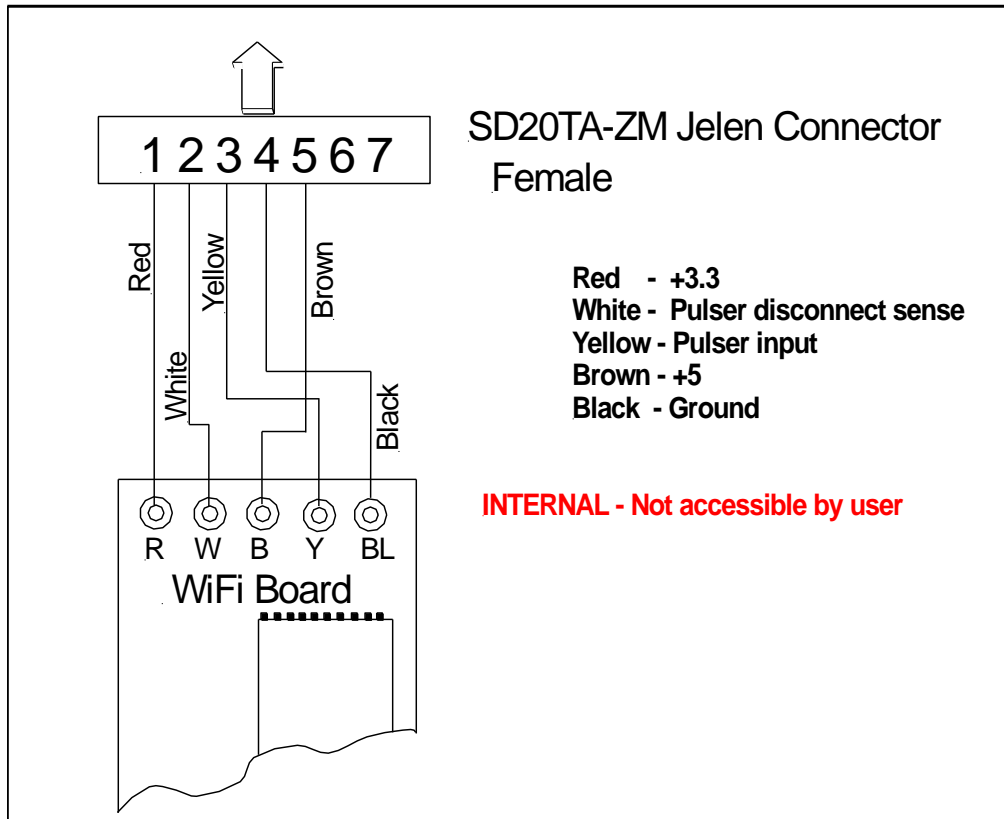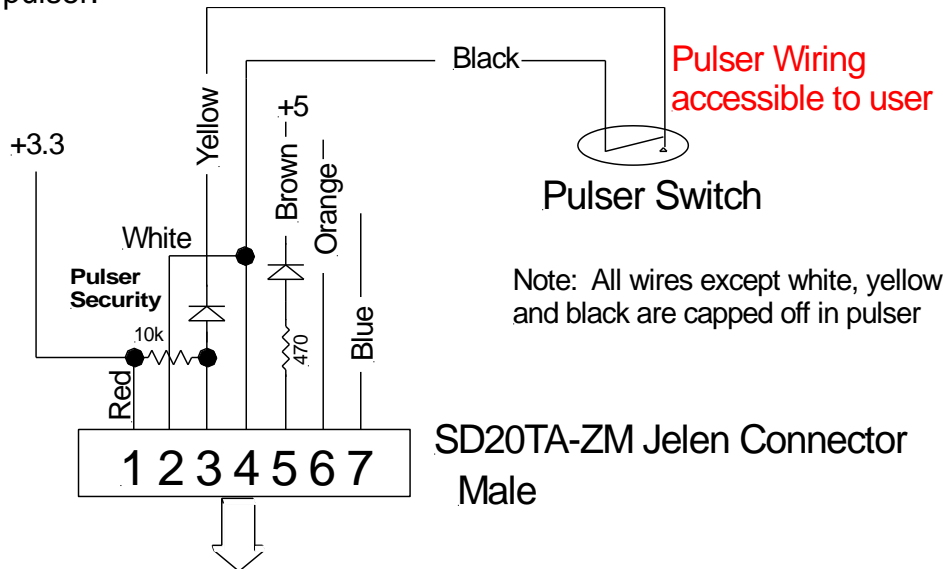- Use non-sparking tools for this operation.

Empty as much fuel from the hose as possible before removing. Hold the end of the hose high once removed until it can be placed in the recycle container for removal of the remainder of the fuel. Once the hose is removed, screw the input end of the pulser into the dispenser using the supplied teflon tape wrapped around the hose nipple adapter. Note that the pulser has an arrow pointing towards the hose end of the pulser. Next, re-attach the hose to the output end of the pulser.   In general, a 1" hose will screw directly into the pulser and a 3/4" will require a 1" to 3/4" adapter.   Connect the included external LINK pulser cable to the top of the FluidSecure LINK.

Pulser

PulserAdapter
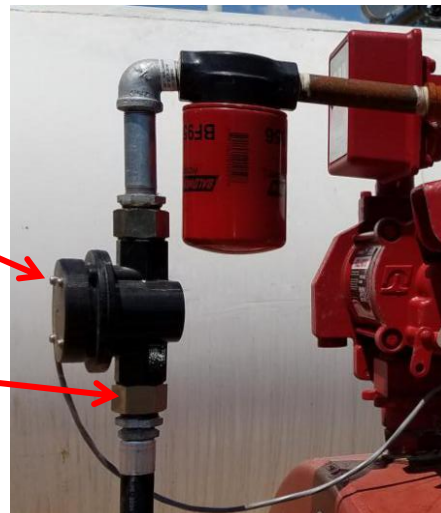
The diagram below shows the wiring connections that are utilized in the external pulser cable.   If using the Trak supplied pulser, the cable is already attached to the pulser and the installer simply needs to plug the cable into the top of the LINK.   If using alternate third party pulsers, the cable is not terminated at the pulser end.   The diagram below shows the the electrical connections that form the LINK pulser cable.   The cable will have to be connected to the third party pulser by using the appropriate wires suitable for the pulser.



Pulser Wiring accessible to user

Pulser Switch

Note:  All wires except white, yellow and black are capped off in pulser

SD20TA-ZM Jelen Connector
Male

1 2 3 4 5 6 7

SD20TA-ZM Jelen Connector
Female

1 2 3 4 5 6 7

Red   -  +3.3
White -  Pulser disconnect sense
Yellow - Pulser input
Brown - +5
Black  - Ground

INTERNAL - Not accessible by user

WiFi Board

R   W   B   Y   BL

**#2: Utilizing Exiting Pulsers on Dispensers/Meters**   Many dispensers and metering systems come already equipped with pulser units or can be equipped with third party pulsers.   The LINK will interface with most of them.   The LINK is equipped with 2 separate pulser inputs.

a) The first pulser input is a two wire combination that exits from the **bottom** of the LINK with all the other wires and is referred to as the LINK internal pulser wires. Please see wiring diagram on page 5.   This input is used when the existing pulser wires are already internal in the conduit system.   These two wires, orange and gray, are part of an optically isolated circuit.   Connecting them together causes the optical circuit to flash.   This in turn will pulse a single pulse each time the wires are connected.   An external pulser will have to connect the two wires for each pulse.The gray wire is ground and the orange wire is positive.

b) The second alternate pulser input enters into the LINK at the **top** of the LINK through the 7-pin circular connector as shown on page 8.   This is the same cable that is supplied with the Trak flow pulser but has no pulser on the end.   The wires can be connected to any pulser output by tying the wires together using wire nuts. The wiring from the FluidSecure LINK is designed intrinsically safe and can be safely run without conduit in a Class 1, Division 1 location or any lesser classification. Do NOT allow it to enter into a junction box, conduit or other device that could connect these pulser wires to external high voltage wiring.

The black and yellow wires form a pulled up circuit that the external pulser must connect together to pulse the circuit.   External 5VDC is also supplied via the red wire to power an external pulser circuit.

## 4) Low Voltage Wiring Connections

The LINK is capable of running from 12 to 24 VDC instead of AC power.   The electrical diagram in A.2. shows a red and green wire labeled as gnd and +12VDC. The LINK can actually run from 24VDC as well.   These two wires can be utilized for power hookup.   The two brown wires also shown are still used to control the power to the solenoid or pump.   Since the brown wires are not electrically connected internally in the LINK, they can be used with any external control voltage from 5VDC to 240VAC regardless of the power used to operate the LINK.   The same safety warnings apply to low voltage installation as the high voltage ones.

# B.   Installation - Standard Dispenser

Wiring connections are the same as the above ground tanks. However, there are many different dispensers and each one will have differences from one manufacturer to another.   It is not within the scope of this document to address all possible combinations.

In general, the FluidSecure LINK should control a solenoid valve, dispenser authorization signal or a small pump motor. **Under no condition should a FluidSecure LINK control a pump motor larger than 3/4hp.** Larger loads can be controlled with an external contactor or power relay.

## 1) Conduit Connections between Pump and LINK

Installation for standard dispensers is quite simple. Most have an explosion proof junction box located in the bottom section of the dispenser. This junction box generally will have two or more conduits that feed into it. Normally there are additional available conduit openings in the junction box. Simply unscrew the cap from one of the unused ports and screw in the FluidSecure LINK. If there are no available openings you will have to use a rated Class 1, Division 1, T box (or purchase the optional hardware kit) to attach to the junction box and re-route an existing conduit to the box and then attach the FluidSecure LINK. The manual override switch can be removed from the wiring enclosure and inserted into an additional conduit opening in the junction box.
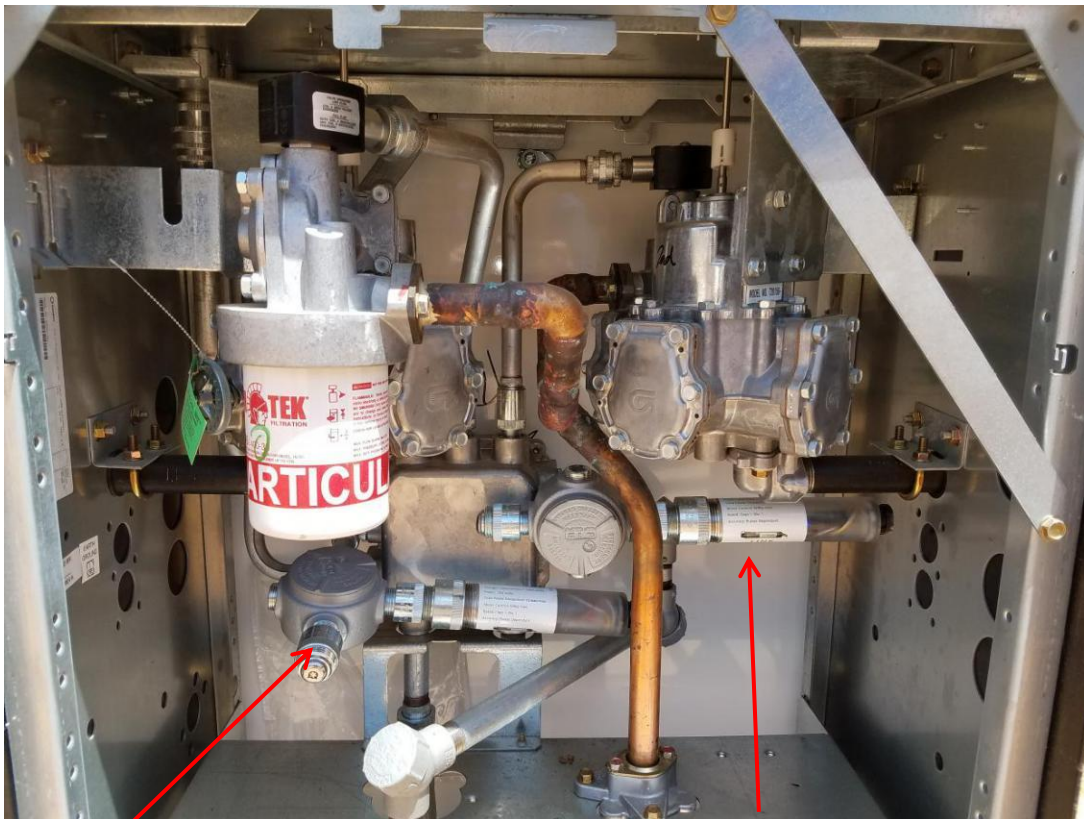


Manual Override        Junction Box                    LINK

## 2) Wiring Connections

Once the LINK is installed, the control wires will be available inside the junction box the LINK is connected to. The wiring diagram in section A.2 is also applicable here. You can control the dispenser solenoid valve, dispenser motor, dispenser control signal input or other such device. The installation typically involves disconnecting the AC power source, making the appropriate electrical connections and re-connecting the wires to the FluidSecure LINK and dispenser. **Under no condition should a FluidSecure LINK control a pump motor larger than 3/4hp.** Larger loads can be controlled with an external contactor or power relay.

# 3) Pulser Installation

Many dispensers have included pulsers which can be attached to the FluidSecure LINK. To connect to an existing pulser wire that is **located outside the conduit system**, you must utilize the cable and connector that is supplied with the FluidSecure LINK. The external pulser wiring from the FluidSecure LINK is designed intrinsically safe and can be safely run without conduit in a Class 1, Division 1 location or any lesser classification. Do NOT allow it to enter into a junction box, conduit or other device that could connect these pulser wires to external high voltage wiring

Other pulsers often have their pulser wires **within the conduit system** and can connect to the internal LINK pulser wires. Those pulser wires are shown in the drawing in section A.2 and are labeled orange and gray. The gray wire is ground and the orange wire is positive DC.

It is not within the scope of this document to cover all possible pulser combinations that exist on standard dispensers. However, there are generally two common types that are often used.

1. Reed Switch or microswitch - This is a non- powered switch that opens and closes for every tenth of a gallon. Some will count more often and others less but a 1/10-gallon pulse rate is extremely common in the commercial environment. Connect either wire from this type pulser to the red and green wire in the pulser cable.

2. Open Collector - This is a powered pulser and generally requires 5 to 12 volts to operate. In general, you will have to determine which of the pulsers wires is ground and which are the pulse output. Additionally, if the pulser requires external excitation, you may have to connect a 5 or 12-volt line to the pulser. The FluidSecure LINK produces a 5 VDC output that can be used to power an open collector circuit. The diagram in section A.2 shows those connections.

# C. Operating Instructions

Your physical installation should be complete. Power the dispenser on, which in turn will power the FluidSecure LINK. You will notice a faint blue light in the top half of the FluidSecure LINK when power is applied. If there is no light, reconfirm that power is present. If no light is observed, recheck your electrical connections and try again. If no light is still not observed, refer to the troubleshooting section using the manual.

**Calibration of the Pulser vs the Meter:**

The FluidSecure pulser must be calibrated unless you know 100% the ratio (example 10:1). The FluidSecure LINK along with the optional purchased pulser or if you are using an already installed pulser, you must read how many pulses are produced per unit of measure (gallons, liters, quarts, etc.). We will use the word gallon in this explanation, but it can be any unit of measure. To calibrate the pulser you must have an authorized cell phone. In the FluidSecure Information page, in the FluidSecure CLOUD, you will need to enter in the number of gallons pumped during calibration. The pulses field can be any initial number.   You must contact your FluidSecure administrator to obtain authorization to run a calibration. Once authorized, you will have to either pump fuel into a calibrated container or use the existing meter on your dispenser to calibrate.   <u>If you have just installed the pulser (and you probably have at this point) you must pump at least 20 to 30 gallons back into the tank to purge the air out of the pulser and hose.</u> For calibration, It is best to pump at least 5 gallons for high accuracy but a smaller amount can be utilized. To begin the calibration, refer to your cell phone user guide for the FluidSecure APP. Start a transaction and begin pumping into your calibrated container. If you are using your existing meter, then simply pump the fuel back into the tank or into a vehicle. Stop at a full gallon mark as close as you can. It doesn't matter how many gallons you pump but the more the better. (Please note that we refer to gallons, but the label is unimportant. You can use quarts, liters or anything else.) When you are finished, the cell phone will display a count. Call the administrator and report to them total gallons you pumped and the counts. That is all there is to it.

# D. Quick CLOUD Startup Guide

Once installation is complete you will need to enter some data into the FluidSecure CLOUD webpage.   Once the system is shipped, a Company page will be setup automatically allowing you to start using the software.

The CLOUD-based software must be filled out in proper sequence before any testing can be performed and transactions at the fuel locations can be started. Any users must

be authorized and the FluidSecure LINK must be initialized. These steps will guide you through the process. Please do them in order so you don't have to repeat steps.

## 1. Company Information Page

Enter:

Company Name, Contact Name, Contact Address, Contact Phone Number and Contact Email.   These can be modified or updated later if necessary.   Press Save.



## 2.   Select Product Type

Enter in a Product Type (Unleaded, Diesel, etc.).
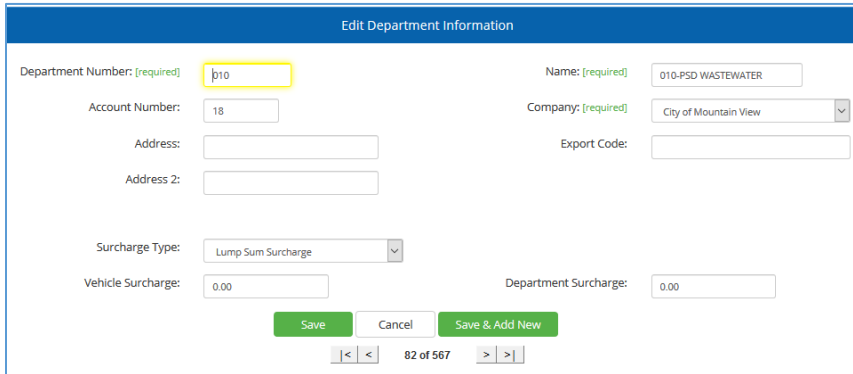
## 3. Edit Department Information

Enter in Department Number (we suggest you start with 1) and Name. Again, these can be changed later if necessary.



## 4. Edit FluidSecure LINK Information

Enter in FluidSecure LINK Name - start with 1

Enter in FluidSecure Current Name - enter in the serial number that is on the FluidSecure LINK. The serial number is all alpha characters.

Enter in FluidSecure New Name - The name you would like for it to be identified by all users, for example "Unleaded" – this shows up as the HOSE name on the APP

Enter in a Tank Number - start with 1

Enter in the product in the tank from the drop-down menu

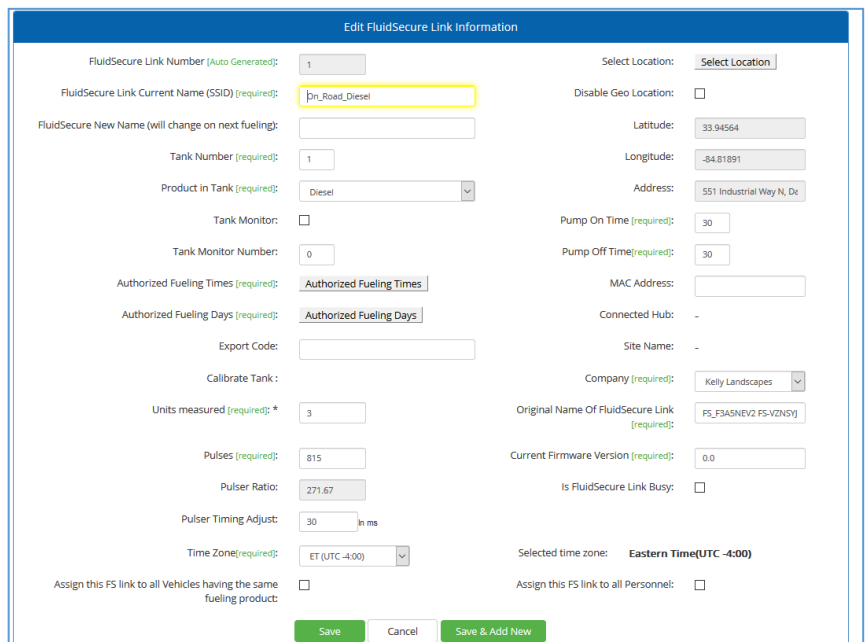Select Authorized Fueling Times

Select Authorized Fueling Days

Check Disable Geo Location

Enter in a Pump On Time - usually 30

Enter in a Pump Off Time - usually 30

Select Company from drop down menu

Enter Original Name of FluidSecure LINK - this is the serial number entered above

Enter Units Measured - enter 10

Enter Units Measured - see Calibration above

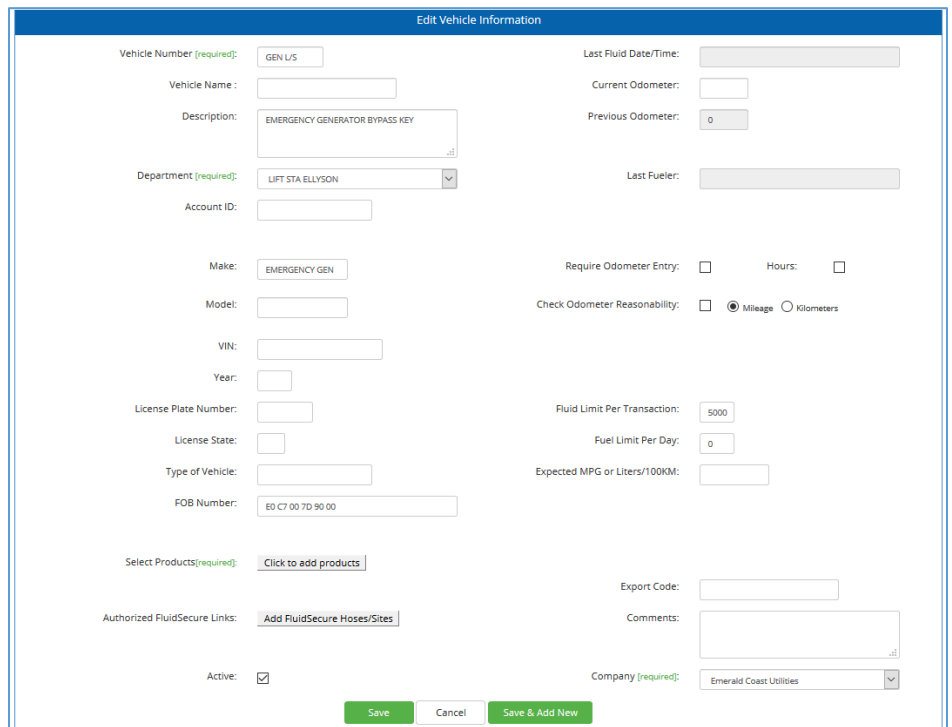Select Time Zone from drop down menu

## 5. Edit Vehicle Information

Enter Vehicle Number - Usually how your vehicles are identified

Enter Vehicle Name - Name of vehicle and what the transaction reports show

Enter Department - from the drop-down menu

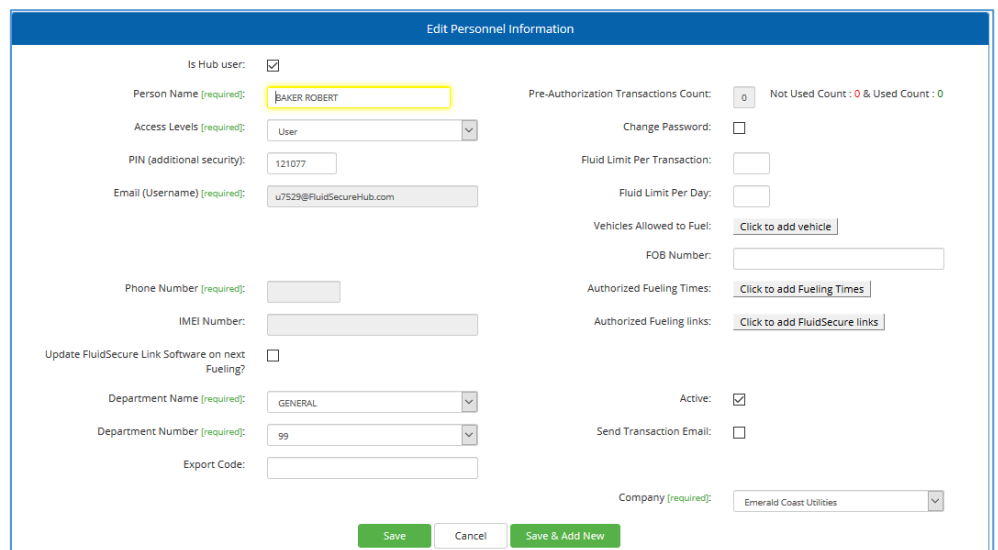Select Authorized FluidSecure LINKS - the hoses at which this vehicle will be allowed to fuel at



## 6. Enter Personnel information

No fields are required at this time. All users are required to download the FluidSecure APP to their phones and register on their own phone. Once registered you are required to go back to this page to:

Enter in their Access Level – usually "User"

Department - select from drop down menu

Select Vehicles Allowed to Fuel - these are the vehicles      this person is allowed to fuel

Select Authorized Fueling Times - these are the times of the day this person is allowed to fuel this vehicle

Select Authorized Fueling Sites - these are the sites at which this person is authorized to fuel at

Active? - click this if this person is allowed to fuel, un-click to de-authorize fueling permission.