

AquaFlow Intl' Inc.

Automated Bulk Water Loading Stations



AquaVendor RFID Card Based System

System User Guide

Founded and Operated in Flagstaff, AZ USA



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An Introduction

In 1998, Jon Keller started a water dispensing company called WaterProducts.net Inc., servicing water companies in the Southwestern part of the United States. WaterProducts.net Inc. had a magnetic strip card system, which was commonly used by water companies.

In 2009, Jon started working on a replacement system that was better suited for modern technologies due to an end-of-life notice from the magnetic strip card manufacturer. Over time, Jon designed 3 water systems that were simple and flexible with customer needs, and in 2011 AquaFlow Intl, Inc. was born. As of 2012, AquaFlow Intl, Inc. has more than one hundred stands in operation throughout the United States and overseas.

AquaFlow Intl, Inc. specializes in water payment systems that are easy to use and ensure guarantee payment to water companies for their bulk water sales. As previously mentioned, AquaFlow Intl, Inc. has 3 systems that make this possible: the AquaFlow II RFID card system, the AquaVendor card system, and the AquaTrack internet cloud-based system. Each system has a set of unique features that allow them to stand out from other common water systems. AquaFlow is skilled in retro-fitting existing systems as well as building a complete turnkey system from the slab up.

AquaFlow manufactures its own parts in Flagstaff, Arizona and its systems meet the requirements of the "Made in America" Act as well as the Davis Bacon Wage Act. The company is in good standing with the Arizona Corporate Commission as can be verified at: <http://ecorp.azcc.gov/search>. AquaFlow Intl, Inc. is an OEM manufacturer operating in the state of Arizona. No contractor license is required to provide installation oversight on our systems. AquaFlow Int'l, Inc.'s employees shall never drive a vehicle that is not owned and insured by the company. AquaFlow Int'l, Inc. maintains 4 million dollars worth of general liability insurance.

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System Overview

Definition-

The AquaVendor system is a RFID card based water system. The purse/value is held on the encrypted RFID card. All data for customer accounts is stored on the card. The system is designed to allow remote operation from the water company office over the water loading stations using a third party onsite manager. The onsite manager will have a special RFID card that holds value he can transfer to customers' cards as desired. The water company can re-load the site manager's card via internet. The customer interface can control up to 3 electronic valves that makes water loading easy for customers with different needs. Each transaction in the system is tracked and the logs can be transferred to a standard USB flash drive. All the data is contained in a .csv file format to use with 'Excel' or similar programs. The system is simple and easy to use for both the onsite manager and customers.

System Requirements-

1. Water company owner shall provide power and water pressure to the loading station.
2. Internet connection to the loading station required. Cell based router recommended.

Warranty-

A 1 year warranty is provided with the purchase of this system. AquaFlow Intl Inc. offers an extension of the maintenance and software warranty on a year by year basis. The extended warranty program gives you about a 30% discount on repair parts, free labor and priority service.

Our repairs are handled on a UPS basis. If your system goes down for any reason, simply give us a call and we will help you troubleshoot the system. If any part of the control system is not functioning properly and/or needs to be replaced, we will UPS you a new control board within 1 Business Day guaranteed. You then replace the control board (again, AquaFlow will be available via phone 24/7 to assist in any questions) and you are back up and running. We then require that you UPS your damaged board to us for evaluation and repair.

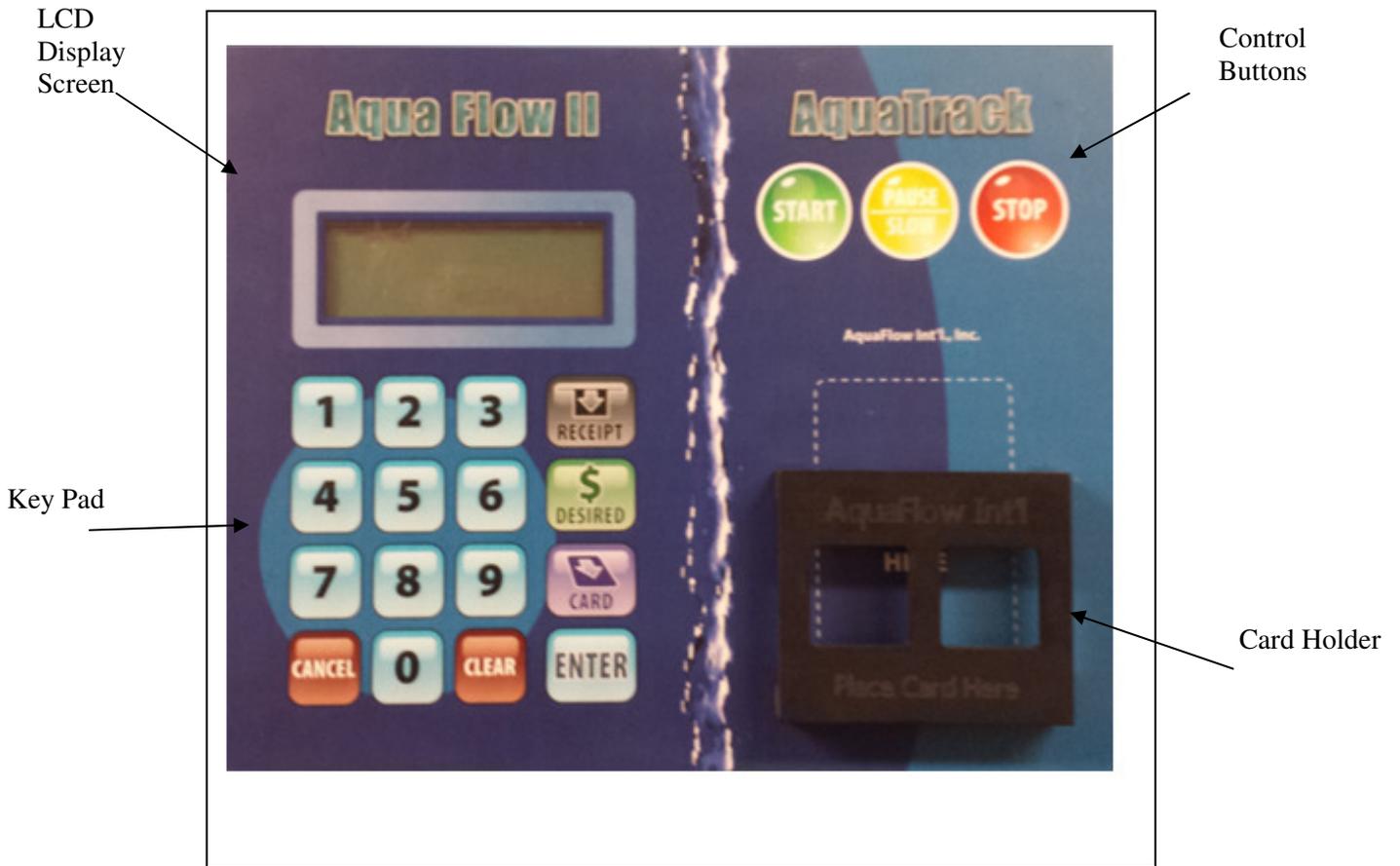
If the extended warranty is maintained, you shall be billed for the repair parts needed at the reduced rate. Also with the extended warranty, there is no charge for labor on repairs.

The AquaVendor RFID card based system is warranted against factory defect for one full year. Damages not covered by the warranty are as follows: Acts of God, Acts of War, Acts of Terrorism, and Accidents (except by AquaFlow Int'l Inc. personally), Power-related issues (such as lightning strikes or power surges), or vandalism.

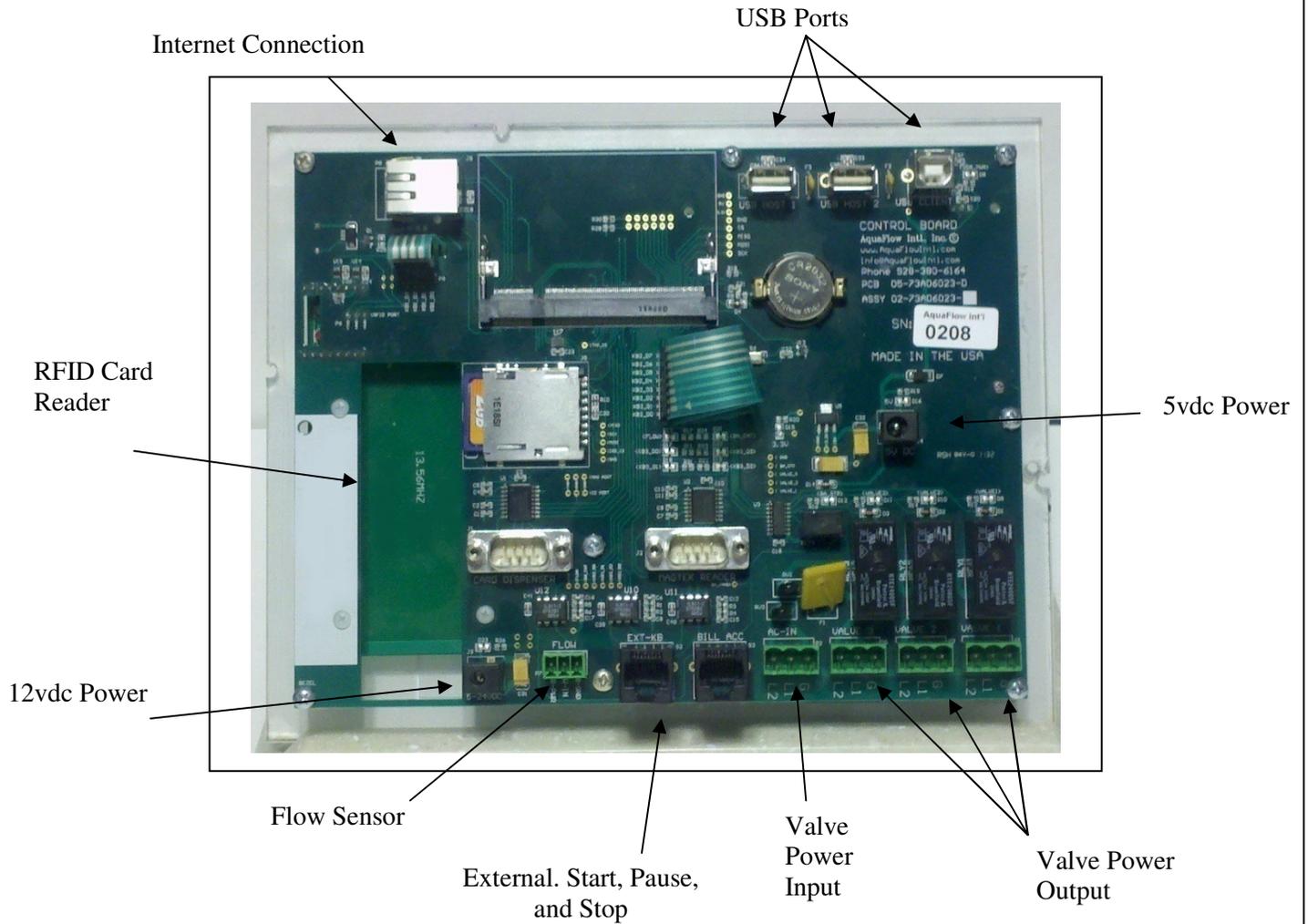


Faceplate Diagram

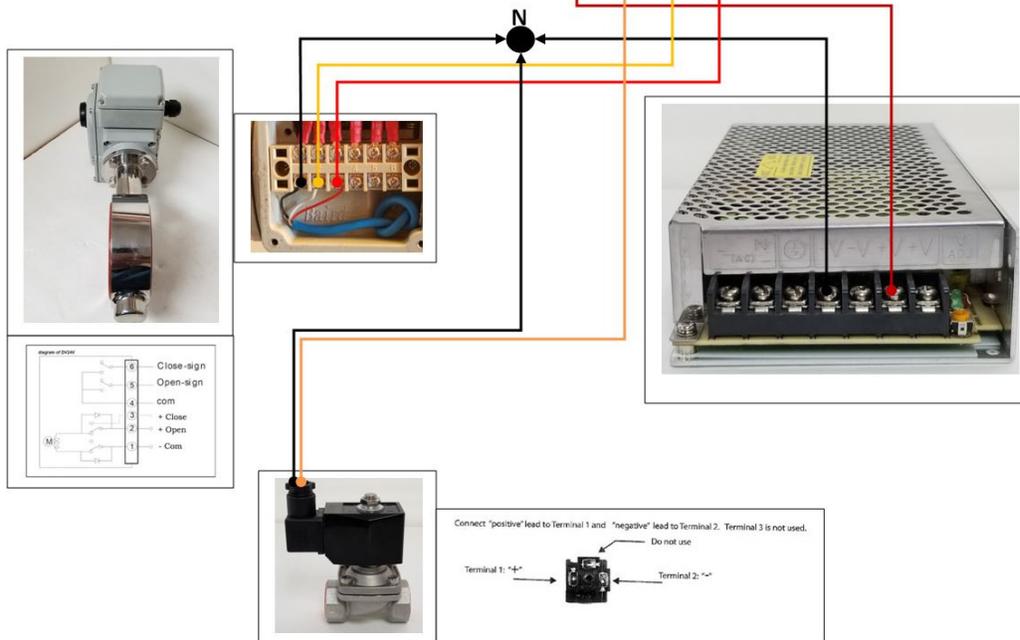
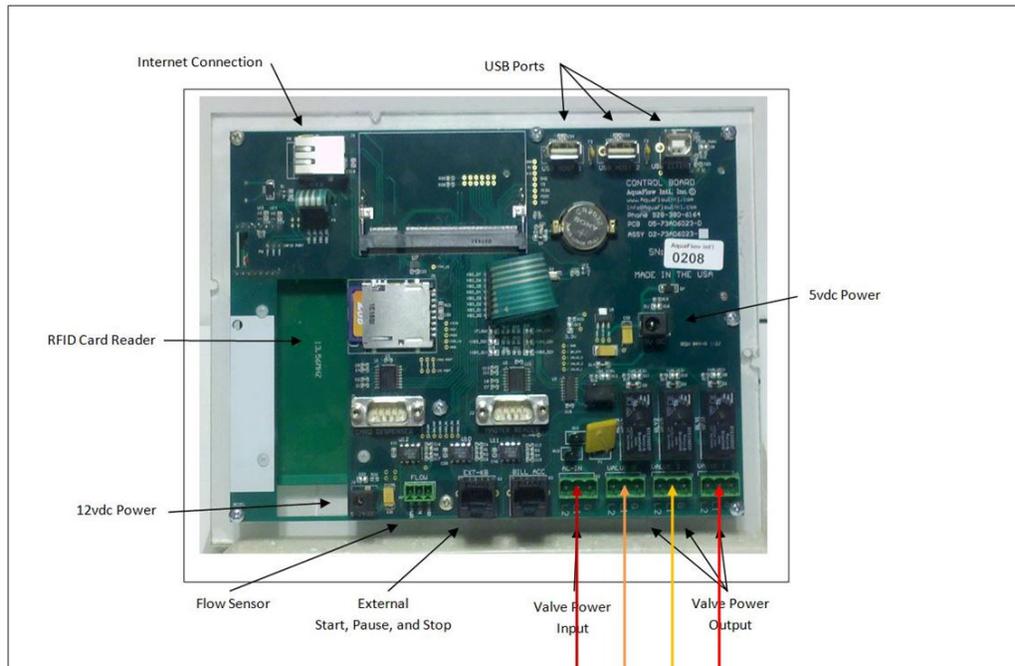
Front of Faceplate



Back of Control Board



Valve Wiring Layout



24vdc - 3" Butterfly Valve and a 24vdc - 3/4" Diaphragm Valve

System Benefits

At AquaFlow, we are dedicated to researching and updating our systems as often as needed in order to provide satisfactory, quality service for our customers. The AquaVendor RFID system has many features that make it stand out from other bulk water systems. Below are just some of the features that prove the AquaVendor RFID system is the best system for you.

1. No pre-assigned PIN for cards, customers may choose their own PIN.
2. The system's flow sensor allows calibration to any measurement units.
3. New RFID Smart Card technology, no contact necessary.
4. No card slot to clean means low maintenance.
5. Encrypted data prevents copying cards.
6. All events are tracked and kept in system logs that you can store on a USB Flash Drive for easy access.
7. The Customer Interface can control up to 3 exit ports at a time.
8. Lower power protection
9. Lightning strike protection.
10. Custom programming available.
11. Lower repair cost due to modular design.
12. Sealed system, water proof.
13. Video training available online 24/7
14. Large keypad that makes it easy for gloved hands to use during cold weather conditions.
15. The system does not need any additional computers for operation. The customer interface/faceplate has a built in computer.
16. The system comes with 200 custom printed cards. Additional cards may be ordered at a low price rate, (in lots of 100) with no max limit to any order.
17. The system is made of modules, which means the screen can be replaced separately as is the case with the keypad, faceplate, computer, or interface modules.
18. The enclosures for the system are heated with a 9x12 thermostatically controlled heater. The enclosure is filled with 2" of rigid insulation for an R value greater than R11, plus the Alum sheeting and FRP panels for an R value that is greater than 14.
19. Ideal for remote areas/countries.



Detail Operation

System Setup

1. Mount the faceplate enclosure through the building (or enclosure) wall.
2. Place USB Flash Drive provided by AquaFlow Intl' Inc. in 'USB Host 2' port.
3. Connect the Valve 'Input' and 'Output' power connection.
4. Connect the flow sensor power (12 vdc).
5. Connect the 5vdc computer power.

**** The system will take about 1 minute to boot up****

6. Enter the deployment Manager Menu
7. Choose #10 from the menu in order to set the date and time.

**** Date must be entered as MMDDYYYY****
Time is in military time. I.E.- 17:00 for 5pm

8. Choose #12 to set the beep feature 'ON' or 'OFF' for keypad presses.
9. Choose #20 to calibrate the system if it is the first time using. (You can manually set the K, Y, and X factors if you already know them, simply press #21 to set K, #22 for Y, and #23 for X) Take a read on your meter, and press the green 'START' button. After a minimum of 800 liters has passed, press the red 'STOP' button. The system will then prompt you to enter the number of units that passed. Take a new read on your meter, and subtract the old read to get the # of units. The system will then tell you the K, Y, and X factor. AquaFlow recommends writing these factors down and storing them in the office for future use.

The system is now setup and ready for use.

Transferring Logs

Simply Plug in your flash drive into "USB Host 1" The screen will then prompt you to Press 1 to transfer logs. You press #1 and you then take your flash drive out and you are done.



Customer Use

The customer is issued a card by the operator at the loading site.

When the customer arrives at the site, the system is in 'WAIT' mode, meaning it is ready for customer use. The customer will set the hose in order to fill their tank. They will then put their card in the customized holder. The customer is automatically prompted to enter their PIN. The balance on the card is shown, and the customer is then prompted to push the green 'START' button in order to begin their transaction. If they are at a 2 valve system, the customer is told to push '1' for 2" or '2' for 4" and so on.

The system will show the customer their balance as the amount of value decreases on the card. The customer may hit the red 'STOP' button at any time in order to end the transaction. If the customer does not hit the 'STOP' button, the transaction will end when the desired volume entered by the customer is reached or until the value on the customer's card shows a \$0.00 balance. The customer will only pay for what he receives. The system will then show the ending balance on the customer's card and how many units of water they just received. To end the transaction, the customer will simply need to remove his card from the holding slot. Customers may repeat the process as long as they have money on their card.

The system will not give water when the card balance is \$0.00

****If the customer removes their card during the transaction, they will be prompted to return their card to the slot in order to receive their refund. The system will beep as a reminder to do so for 15 seconds. If the customer does not return their card within the reminder time, the system will then reset itself to the 'WAIT' mode.****

If a customer claims they have not received their refund for a failed/incomplete transaction, it is best to always double check the logs for that day. For example, if the log shows that the customer received 100 units of water and paid \$100.00 for it, it is clear they did not return their card into the card holder in order to receive their refund.

Setting up a new Site Manager on the internet

1. The deployment manager logs into www.aquaflowsite.com and enters his/her login information.
2. Click on "Accounts" on the left side tab.
3. To create a new 'Site Manager', click on the "Add Account" tab above the center section.
4. Enter the "Site Manager" name in the 'Name' field.
5. Click on 'Save'
6. Click on "Accounts" again on the left side tab list.
7. Find the previously entered Site Manager's name on the accounts list. Click on "Add Member".
8. Add the Site Manager's name in the 'Name' field.
9. Add the Site Manager's Card number into the 'Card' field.
10. Add a custom 4 digit PIN to the 'PIN' field.
11. Click on the 'Save' button
12. Click on the "Accounts" tab on the left.
13. Find the manager's name on the accounts list. Click on "Add Transaction".



14. Choose "Credit" from the drop down menu.
15. Enter the "Amount" (number of units) you want to add to the manager's card. The system will say "USD", but this actually represents the volume you want to add to the site manager's card.
16. Click on "Save".

Setting up a New Site Manager at the Loading Station Control Panel:

1. Enter your 'Deployment Manager' Login and PIN. (A menu will begin scrolling down on the screen.)
2. Press "52". You will be prompted to replace your card with the site manager's card.
3. Place the blank site manager's card in the holder. You will be prompted to remove the card when the process has completed.
4. Press the "Cancel" button multiple times. This will reset the system to 'WAIT' mode.
5. Place the new "Site Manager" card in the holder.
6. Enter the site manager's card number when prompted and then press 'ENTER'.
7. Leave the card in the holder. You will then be prompted for a PIN.
8. Enter the custom PIN for this card and press 'ENTER'.
9. You will be prompted to re-enter the PIN. After doing so, press 'ENTER'.
10. Press # '38' to update the card with the new value that was added on the internet.

**** The Site Manager's card is now available for use****

Disabling a Site Manager Card on the Internet:

1. The deployment manager will log into www.aquaflowsite.com and enters his/her login information.
2. Click on the 'Accounts' tab on the left side.
3. Find the manager's name on the accounts list and then click on the 'Edit' button.
4. Un-check the 'Is Active' box.
5. Click on 'Save'.

Disabling a Site Manager Card at the Loading Station Control Panel:

1. Enter your deployment manager login & PIN. (A menu will start scrolling on the screen.)
2. Press '04'. You will be prompted to enter a new 'Site PIN'.
3. Enter the new site PIN and press 'ENTER' **.
4. Press the 'Cancel' button several times. The system will then reset into 'wait' mode.

When the site PIN is changed, the next time the site managers will try to use their cards, the system will check the internet account to ensure their cards are valid. If their accounts are still valid, then it writes the new PIN to each site manager card. If the account has been deactivated, then that site manager card is erased.



Making a New Customer Card:

1. Place the 'Site Manager' card in the holder and enter the PIN when prompted.
2. Press '54'. You will be prompted to replace your card with the new customer card.
3. Remove customer card when prompted.
4. Place the site manager's card in the holder
5. Press '32'.
6. You will be prompted to enter the value that you want to transfer to the customer's card. Enter the value and then press 'ENTER'.
7. Replace the site manager's card with the customer's card. The new balance will show.
8. Leave the customer's card in the holder. Enter the customer's card number when prompted.
9. Enter the customer's custom PIN when prompted.
10. Re-enter the PIN.
11. Press the 'Cancel' button multiple times. The system will then reset to 'wait' mode.

****The Customer's card is now available for use****

Adding Value to a Customer's Card:

1. Place the 'Site Manager' card in the holder and enter the PIN when prompted.
2. Press '32'.
3. You will then be prompted to enter the value wanted on the customer's card. Enter the value, and then press 'ENTER'.
4. Replace the site manager card with the customer's card. The new balance will be shown on the screen.

**** The customer's card is now available for use****

Adding more Value to the Site Manager's Card:

1. Call the deployment manager or the water station office and have them add value to your account online.
2. When completed, place the site manager's card in the holder and enter the PIN when prompted.
3. Press '38'. The value that is online will be transferred to the site manager's card.
4. Press the 'cancel' button multiple times. The system will reset to 'wait' mode.

Setting the Date & Time at the Control Panel:

1. The date and time are retrieved from the internet. If internet service is not available, it can be set manually.
2. Place the site manager's card in the holder and enter the PIN when prompted.
3. Press '10'.
4. Enter the date in the format: MMDDYYYY



5. Enter the time in the format: HH:MM. Time should be entered in military time. (i.e. 17:00 is 5pm.)
6. Press the 'Cancel' button multiple times. The system will reset to the 'wait' mode.

Setting the Calibration:

****Use a meter to calibrate, or a tank of a known specific size.****

1. Place the site manager's card in the holder and enter the PIN when prompted.
2. Press '20'.
3. Choose the desired valve to be calibrated.
4. You will be prompted to press the green 'START' button to allow 800 liters to run.
5. Press the red 'STOP' button when you have reached the 800 liters or when the tank is full.
6. You will be prompted to enter the volume amount you received.
7. When you enter the volume, then the system will show you the 'K' & 'X' factors. Write these down. It is recommended that you store them in a place that is easy to locate for future use.
8. The system is now calibrated.

Additional Options:

Site:

1. Receipt printer
2. Multiple exit ports
3. Error light
4. Solar power
5. Backup heater

Office Unit:

1. Receipt printer



General Water Fill Rates

- ❖ 2" line fills at a rate of 80 -120 GPM (50-80psi) depending on water pressure. A 2,000 gallon truck would take about 20 minutes to fill at 100gpm.
- ❖ A 3" line fills at a rate of 350 -450 GPM (50-80psi) depending on water pressure. A 2,000 gallon truck would take about 6 minutes to fill at 350gpm.
- ❖ A 4" line fills at a rate of 600 -800 GPM (50-80psi) depending on water pressure. A 5,000 gallon truck would take about 6 to 8 minutes to fill at 600gpm.
- ❖ The most common size station is 2".
- ❖ You can have either an 'overhead loading station' or a 'side loading station'.
- ❖ We can retrofit our systems into your existing station(s), or provide a turnkey solution.
- ❖ Our system can run multiple (up to 3) valves with one customer interface. (ie... customer can choose between a 2" overhead, a 3" side loading, or a 1/2" 5 gallon fill from the same customer interface).
- ❖ Note: one customer loading at a time.



Glossary

Calibration:

Setting the flow sensor to match the volume on your meter.

Transaction Charge:

The system allows you to charge a 'per fill up' price in addition to the rate you charge for the volume of water. If a customer has a tank on the truck and another on a trailer, the customer can fill the truck tank and then hit the 'PAUSE' button. The customer then can move the truck to fill the trailer's tank. The customer hits the green 'START' button to continue the fill. In this instance, the customer would only pay 1 transaction charge.

K Factor:

The K factor is the number of pulses the flow sensor sends to equal 1 unit of measurement. A 2" system using US gallons is normally set somewhere around 100 pulses. The AquaVendor system makes setting the K factor easy.

X Factor:

The X factor is the number of units that pass from the time you press the red 'STOP' button until the water stops flowing. This is the time the valve takes to close.

Y Factor:

The Y factor is the number of seconds the system will wait for water to flow past the flow sensor before it stops the system due to no water flow.

Deployment Mgr. Menu:

This is the setup menu where you can set all the preferences and settings for the system.

Site Manager:

This is the third party located at the water station that makes it easy for the water company to remotely operate their water loading stations. The site manager possesses a RFID card that holds value to transfer onto customer's cards/accounts.

RFID:

Radio Frequency Identification



RFP Data

1. Company:

- 1.1. Company must have been in business of selling bulk water loading systems for 10+ years.
- 1.2. Company must maintain a minimum of \$2,000,000 of general Liability Insurance.
- 1.3. Company must maintain a 24/7 tech support line.

2. Enclosure:

- 2.1. Enclosure height to allow for a person to stand and do any repairs needed.
- 2.2. Enclosure to be constructed of corrosion resistant materials with protective coatings as necessary.
- 2.3. Enclosure shall be insulated with a minimum of 2" of rigid insulation.
- 2.4. Enclosure shall have a thermostatically controlled heater.
- 2.5. Enclosure shall have an Electrical Sub Panel box inside.
- 2.6. Enclosure shall have a full height door.
- 2.7. Enclosure shall have a GFI electrical outlet.
- 2.8. Enclosure shall have a light controlled by a light switch.

3. Water Components:

- 3.1. Enclosure shall have a RP style backflow device.
- 3.2. Enclosure shall have a flow sensor with an accuracy factor of 1.5%.
- 3.3. Enclosure shall have a stainless steel 24vdc electronically controlled valve.
- 3.4. Enclosure shall have a stainless steel 24vdc electronically controlled drain valve (if there is an overhead loading port).

4. Water System:

- 4.1. System shall be controlled by a Micro Computer.
- 4.2. Customers shall use a RFID card and PIN to access the water.
- 4.3. System shall have the ability to track an unlimited number of card user's transactions.
- 4.4. The RFID card data shall be encrypted on the card.
- 4.5. A communication line or service shall not be required at the site.
- 4.6. System shall have the ability to charge a transaction charge per load.
- 4.7. System shall have the ability to charge based on a two tiered rate structure.
- 4.8. System shall have the ability to supersede the default rate for any customer.
- 4.9. System shall have the ability to upload logs from the system onto a USB flash drive.
- 4.10. System shall have the ability to control up to three exit ports with one controller.
- 4.11. System shall have the ability to track all transactions.
- 4.12. System shall have 3/4" x 3/4" keys for use by gloved hands.
- 4.13. System shall be modular in design.
 - 4.13.1. The screen shall be able to be replaced separately.
 - 4.13.2. The computer shall be able to be replaced separately.
 - 4.13.3. The control board shall be able to be replaced separately.

The faceplate with keypad shall be able to be replaced separately.

