AVIDwireless ®

Achieving Efficiencies with Remote Monitoring and Control

Using AVIDwireless'
Remote Control and
Monitoring Solutions to
Save Time and Money

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Overview

The Remote Product Services (RPS) market offers many opportunities for businesses to save hard dollars by reducing inefficiencies in operations. One of the most important opportunities for cost savings is Energy Monitoring. By reducing energy inefficiencies wherever possible you can see an immediate effect on saving the company money.

In this white paper we will demonstrate how simple it is to make a direct impact on your bottom line by adding energy monitoring to your organization. By eliminating wasteful practices in your organization you can control those cost that most negatively affect your bottom line. This may seem like just a few dollars but over the course of a month or a year these can add up to hundreds even thousands of dollars, and for larger organizations can add up very quickly.

We will focus on the following items and show how each of these areas can be implemented quickly and easily using the AVIDwireless RPS suite of tools.

- Determine areas to monitor

- Implement the solution

- Track the results

Determine Areas to Monitor

In order to achieve the largest cost savings from energy monitoring you should evaluate the areas of your company where you can gain the largest benefits from monitoring. For example if your company has a large number of refrigeration or freezer units, or heavy machinery with large engines these would typically be an area where immediate improvements can be gained.

Here are some areas for review, begin by making a site survey based on these ideas. Note this list is not all-inclusive you may have some equipment or machinery that you would like to include on the site survey as well. The great thing about AVIDwireless' products is the flexible interfaces that allow it to communicate with anything, so the options are endless.

1. Locate all commercial or non-commercial freezer and refrigeration units on site. These are always a great place to see quick savings. A 1-degree decrease in temperature can save you approximately 6-8% annually on a 1700 cubic foot commercial freezer, so depending on your requirements in terms of temperature ranges for your products this is always a great place to monitor.

2. Locate all commercial or non-commercial ovens or other heating units on site. Temperature and humidity is the top Machine-to-Machine M2M (remote data logging applications) space today. More companies are collecting this information than any other application. So the ability to control temperature whether it is cold or heat is a great way to save energy.

3. Locate all remote monitoring opportunities available, and determine where opportunities exist to use machines vs. personnel. You may think this sounds like a harsh statement in a time when so many

people are out of a job however this is actually a place where it makes sense to utilize the limited resources you have even more efficiently. By eliminating the need for a resource to drive to a remote location to monitor a depth, or a process when that same resource could be used to help with other much needed task. Not only do you save money in fuel cost to drive to the remote location, these typically are high turnover jobs. So being able to use machines cuts down on training cost, fuel cost and using those resources for other more fulfilling jobs help keep people on the job working for you not your competition.

4. Locate opportunities where losses of equipment are high. Any place where you have remote equipment or assets are also places for thieves to easily access. These are places where opportunities for remote monitoring and control coupled with GPS tracking can help eliminate theft.

5. Monitor equipment or resources that have a negative side effect or other adverse outcome on other processes. For example if you have a gas station with an air pump that collects money from people and the pump is out, then you are not able to make money from that machine. The ability to know if that machine is working or not would be something you would want to monitor.

Now that you have your site survey completed, let's take a look at how you can implement a solution that will help you cut cost by eliminating inefficiencies.

Implement the Solution

Based on the information gathered in your site survey you will be able to discuss optimizing you plan with an AVIDwireless associate. Contact us by visiting our site or via the information at the bottom of the page for more information.

The best way to show how to implement a solution is by example. For the purpose of this white paper we will use XYZ Oil Ltd. This company owns several oil wells throughout central Texas and it has a group of small convenience store/gas stations for which they would like to eliminate inefficiencies and work towards increasing their margins over the next year. In this section we will show how XYZ will implement the AVIDwireless solution to monitor and control their processes and help eliminate inefficiencies.

In figure 1 you will see a copy of their site survey, this is the document that XYZ reviewed with AVIDwireless to determine which processes to monitor and control during the first year. With the AVIDwireless implementation in place XYZ can very quickly expand or change what processes or machinery they want to monitor and control at anytime with little effort and cost to them.

XYZ Oil Ltd. Site Plan

Item/Location	Type of Equip	Monitor	Monitor What
Well 124	Engine	Yes	Energy, Output
Well 145	Engine	Yes	Energy, Output
Tank 235	Tank - Depth	Yes	Level
Store 123 Freezer 1	Freezer	Yes	Energy, Temp
Store 123 Freezer 2	Freezer	Yes	Energy, Temp
Store 123 Freezer 3	Freezer	Yes	Energy, Temp
Store 123 Tire 1	Tire Pump	Yes	Energy
Store 123 Wash	Car Wash	Yes	Energy
Store 785 Freezer 1	Freezer	No	NA
Store 785 Freezer 2	Freezer	No	NA
Store 785 Freezer 3	Freezer	No	NA
Pumper 1	On-Site	Yes	Time
Pumper 2	On-Site	Yes	Time
Sam	GPS	Yes	Track
Well 724	Engine	Yes	Energy, Output
Well 345	Engine	Yes	Energy, Output
Tank 564	Tank - Depth	Yes	Level

Figure 1

From the figure above XYZ determined they would like to monitor everything except for the freezers in Store 785.

Based on the recommendation by AVIDwireless XYZ's configuration would be as follows:

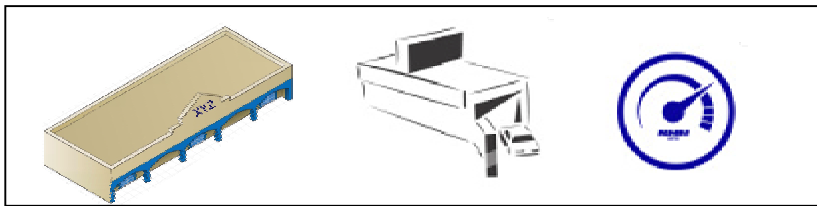Well 124 - Site 1

Well 724 - Site 4

Well 145   Tank 235 - Site 2

Well 345   Tank 564 - Site 5
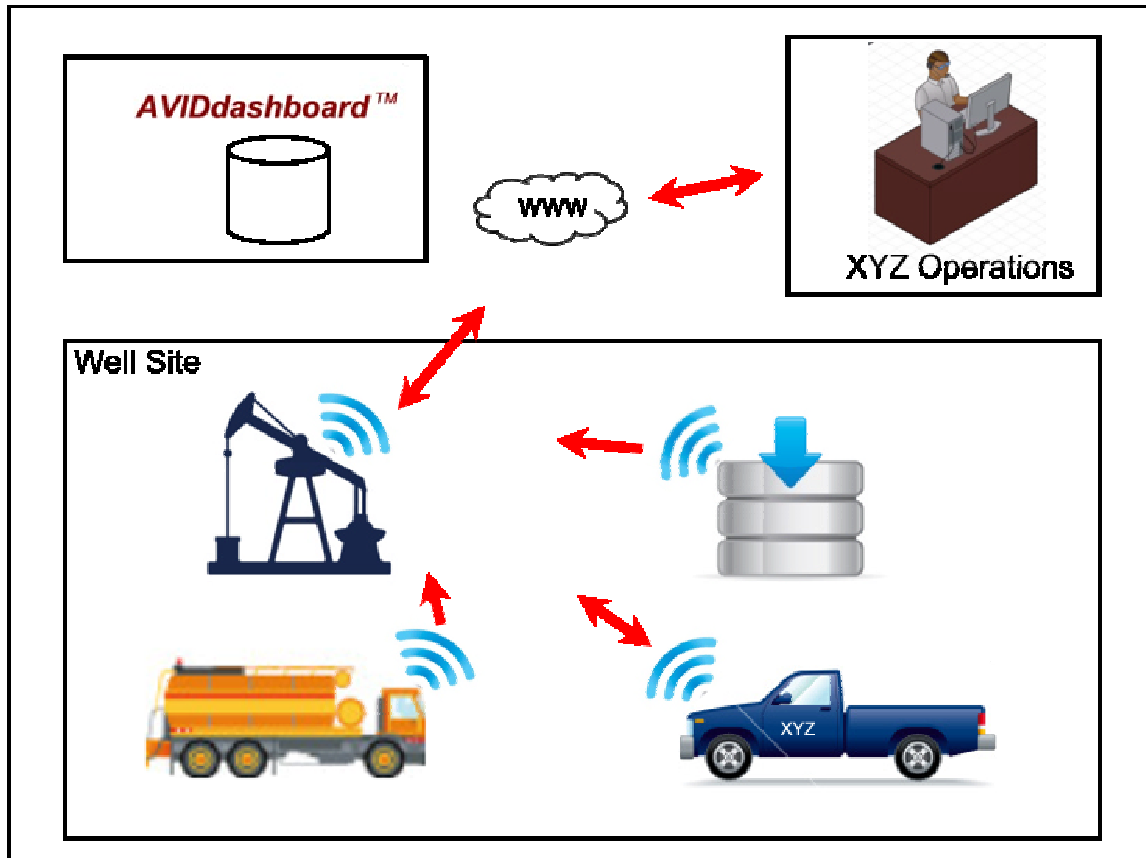
Store 123 - Site 3

Pumper 1

Pumper 2

Sam

Details of the Site Configuration:

- Each Well Site and the Store would be configured with 1 AVIDdirector as the central communication unit.
- Based on the location of the well site the unit would be equipped with the correct wireless communication network, GPRS, iDen, CDMA etc.
- The AVIDdirector is also equipped with a sensor receiver, which communicates with the equipment on-site that is being monitored, see figure 2 for examples of some of the equipment being monitored by operations.
- All 4 well sites will be monitoring the output of the well in terms of energy usage and reporting to the AVIDdashboard every x amount of time. The amount of time is specified by operations and the frequency of reporting time can be change at any time as often as deemed necessary. It may also be different depending on the location, at one site they may choose to report every 5 minutes and another site they may report once a day.
- Site 2 and 5 will additionally monitor tank level, the AVIDdashboard has parameters set so that if the level of the tank rises above x feet or falls below y feet Sam will get a message sent to his cell phone, and other identified personnel at XYZ will receive emails alerting them to the issue. In addition to the emails and alerts the dashboard monitoring screen maintains alerts on the main screen to keep those who may be constantly monitoring the system apprised of alerts. Should XYZ receive a fine due to a hazardous spill the cost to them would range in the area of $50,000 to $100,000. This would be in addition to the cost of repairs to the equipment and the down time while the spill was handled. Alerts are an integral part of the AVIDdashboard system for no additional fees.
- Site 3 would also have 1 AVIDdirector to cover the 3 Freezers on site. This AVIDdirector could be equipped with a cellular modem or connected directly to the Internet via WiFi or Ethernet. The AVIDdirector would monitor the 3 freezers

on-site and alert the Store personnel, and XYZ operations via SMS and/or email if the freezers are running too hot or too cold. This serves several functions for XYZ it protects the inventory that is located within the freezers, it maintains optimum temperature ranges to save on energy cost of operations, and it alerts operations to equipment that is not performing at optimum standards allowing them to better maintain their assets.

• XYZ has also asked for tracking capabilities of Pumpers as they arrive and leave a site. This can be handled by simply equipping each Pumper with a single low cost wireless sensor. The sensor communicates with the AVIDdirector while on-site at a well location, which sends messages to the AVIDdashboard to log the visits and length of time on site.

• Lastly Sam is XYZ's main field support personnel, and they have asked that he be tracked and have full control of the equipment at each site. So Sam's vehicle is equipped with an AVIDdirector, which not only tracks him through the day but communicates directly with other AVIDdirectors as he arrives on-site, similar to the Pumpers. Additionally Sam's vehicle is equipped with a PC, which gives him access to AVIDdashboard wherever he is, so he can send commands to any site, any time.

Track the Results

After implementation XYZ can begin to monitor each of the sites from any web based PC. Each user that needs access to the system is given a unique login id and password. Each user is given authority to their particular areas of responsibilities. For example the manager of Store 123 would have access to the system but would only be able to access the information regarding site 3. Where as the manager of operations would have access to everything.

Each Well Site would track the amount of energy usage and output this will provide the ability to complete monthly reporting and statistics. As you can see below there are a variety of ways to view the information gathered from the various sensors at the sites. As a user you can select to view the important information in a GUI widget on the monitor screen as shown here in figure 2.
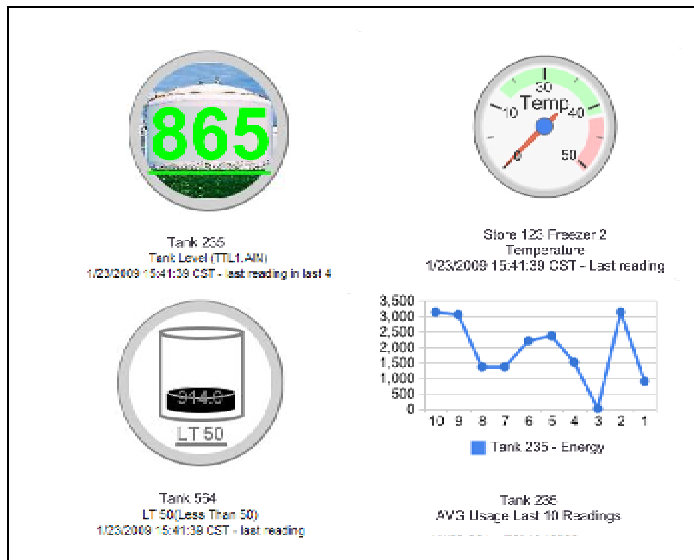

Figure 2

All the information gathered is saved in the database and can be exported to excel spreadsheets or users can create charts using the AVIDdashboard's online chart functions. Figure 3 below shows how the readings are gathered from the field and saved in the system.

| Device	Value	Reading Type	Time Stamp (System)
Tank 235	914.000000	analog	2009/01/23 15:41:39 CST
Tank 235	3154.000000	analog	2009/01/23 15:41:24 CST
Tank 235	49.000000	analog	2009/01/23 15:41:09 CST
Tank 235	1526.000000	analog	2009/01/23 15:40:54 CST
Tank 235	2391.000000	analog	2009/01/23 15:40:35 CST
Sam	MAP 32.86278, -96.94507...	location	2009/01/23 15:18:51 CST
Temperature (C) (TEMP...	24.000000	analog	2009/01/23 15:16:59 CST
Analog Sensor 707651D...	6.000000	analog	2009/01/23 15:16:58 CST
Heater Control (TTL6....	1	digital	2009/01/23 15:16:52 CST
Tank 564	2235.000000	analog	2009/01/23 15:16:51 CST
Sam	MAP 32.86329, -96.94502...	location	2009/01/23 15:11:29 CST
Temperature (C) (TEMP...	28.000000	string	2009/01/23 15:09:36 CST
Heater Control (TTL6....	1	digital	2009/01/23 15:09:31 CST
Tank 564	1377.000000	analog	2009/01/23 15:09:31 CST
Analog Sensor 707651D...	6.000000	analog	2009/01/23 15:09:23 CST
Tank 564	1373.000000	analog	2009/01/23 14:53:57 CST

Figure 3

These readings are collected based on the parameters set in the system to define how often the information should be transmitted, what parameters are within normal operating conditions etc. AVIDdashboard is very user friendly and easy to set up. Wireless sensors can be set up in the field and begin transmitting in formation for viewing and reporting in a matter of minutes.
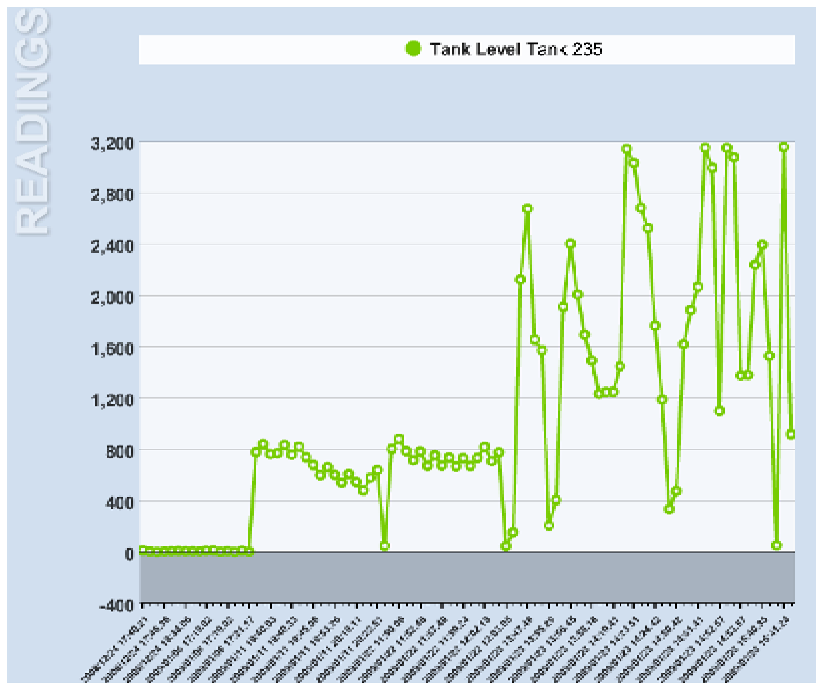
Any of the information can be viewed in chart formation by selecting one of the 4 types of charts from the AVIDdashboard chart functions. The example above shows the tank levels over a 30-day time frame in a Line Chart format. The same information could be displayed in any of the report formats by simply selecting the other report format and pressing view. The other formats currently available are Bar, Area, and 3-D Area.

Finally for tracking Sam the monitor screen will keep Sam's most recent location displayed at all times, and the system can also chart where he has been at any point in time. Give us a call for other ideas where using GPS can help save you time and money.
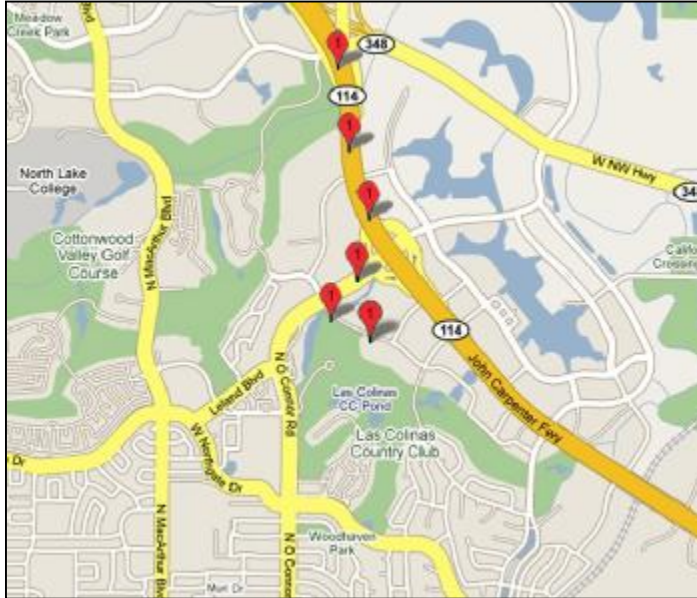
Summary

In summary, the AVIDwireless Remote Product Services suite for achieving efficiencies with remote monitoring and control are affordable, flexible, easy to implement and easy to use. The ability to very quickly implement a solution that will save you time and money by eliminating waste and making better use of current resources are proving extremely valuable to many companies during this current economic climate. Give us a call today to find out how AVIDwireless can help your company save time and money by implementing a new cost effective energy efficient monitoring system.